

SMOOTH-ON

INSTRUCTION

BOOK

№18

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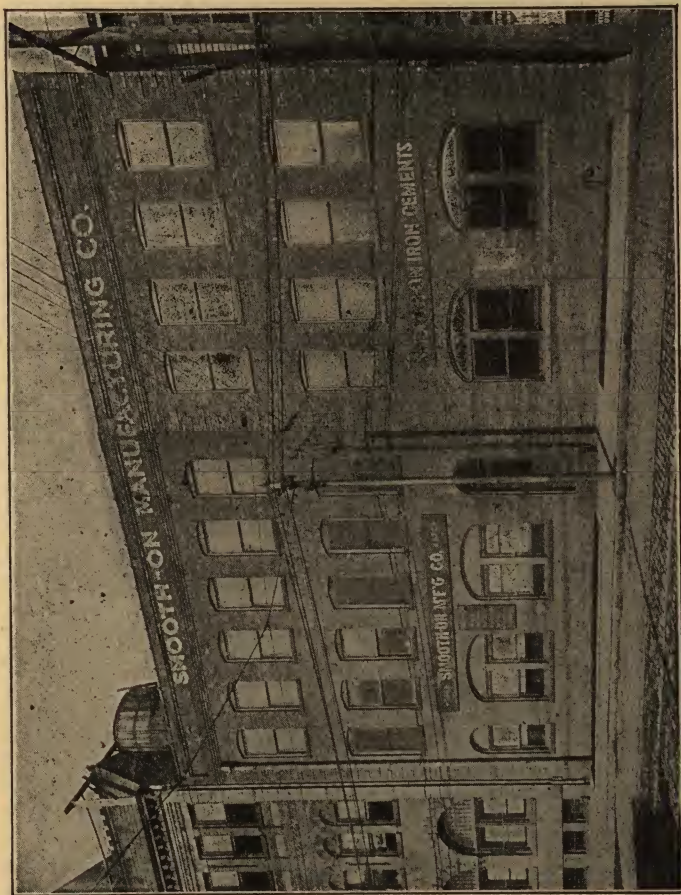
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Works: 51-55 Harrison Avenue, Jersey City, N. J., U. S. A.

Smooth-On Manufacturing Company,

ESTABLISHED 1895

570-572-574 Communipaw Avenue

JERSEY CITY, N. J., U. S. A.

Telephone, 76 Bergen.

SAMUEL D. TOMPKINS,
President.

J. HAVILAND TOMPKINS
Secretary.

VREELAND TOMPKINS,
Treasurer and General Manager.

HAROLD D. TOMPKINS
Mechanical Engineer.

ILLUSTRATED CATALOGUE No. 18.

Telling about the

Smooth-On Iron Cements

Smooth-On Iron Paints.

Smooth-On Corrugated Iron Gaskets,

and

Showing When, Where and How to Use Them.

NOTICE

Purchase SMOOTH-ON Iron Cements in original packages only. Each package is stamped with our trade mark, name and address as below. Directions for use are on each tin package and inside of each steel keg. SMOOTH-ON is not sold in bulk.



Reg. U. S. Pat. Off.

Entered according to Act of Congress in the year 1920
by the

SMOOTH-ON MANUFACTURING COMPANY

In the office of the Librarian of Congress
at Washington, D. C.

INTRODUCTION.

It is said:

"An ounce of prevention is worth a pound of cure."

Yet

An ounce of SMOOTH-ON often saves where a pound of prevention falls.

THE great value of SMOOTH-ON to the manufacturer and user, is because of its peculiar chemical properties, namely—of metallizing and of expanding when metallizing, and it can be prepared to act quickly or slowly, according to the requirements of particular uses.

These properties make SMOOTH-ON a valuable substance in the making of chemical Iron Cements. To this subject the chemist of the SMOOTH-ON MANUFACTURING Co. has given careful study for eighteen years and has succeeded in compounding the valuable Iron Cements known so generally throughout the world as SMOOTH-ON Iron Cements.

These Cements are made each for a special purpose; they are carefully prepared by a chemist, and when correctly used they make permanent repairs.

The different SMOOTH-ON Cements are explained in the following pages; a careful study of them will prove interesting and profitable.

The illustrations are made from photographs of actual subjects, and show some of the many ways in which the SMOOTH-ON Cements have been used and the results obtained.

Do not use any other cement because it is cheaper. It may mean the loss of much money and valuable time.

SMOOTH-ON IRON COMPOUNDS, Nos. 1 and 2.

In BLUE Labeled Cans.

Are chemical Iron Cements for repairing leaks or breaks in castings and for making connections in steam or hydraulic work. They withstand fire. No. 1 quick hardening. No. 2 slow hardening and hydraulic. Applied as a paste or putty. Prepared and sold in Powder form. Must be applied to cold metal. Full description on pages 8 to 44

SMOOTH-ON ELASTIC CEMENT, No. 3.

In GRAY Labeled Cans.

An Iron Cement, especially prepared for use on all seams of boilers or tanks to stop leaks, also for boiler patching and for screw-thread joints. Prepared and sold in Putty form. This cement is hardened by heat. Applied as a paint, paste or putty. May be applied to hot metal. Full description on pages 45 to 77

SMOOTH-ON CASTINGS CEMENT, No. 4.

In YELLOW Labeled Cans.

Is an Iron Cement for repairing blemishes, blowholes or defects in iron or steel castings, made in two grades. Prepared and sold in Powder form. Applied as a putty. Full description on pages 78 to 83

SMOOTH-ON HUB JOINTS, No. 5.

In RED Labeled Cans.

Is an Iron Caulking Cement for bell and spigot cast iron soil and greenhouse pipes, in place of caulking lead and in combination with lead. Full description on pages 84 to 87

SMOOTH-ON PUTTY CEMENT, No. 6.

In WHITE Labeled Cans.

A plastic Iron Cement prepared and sold in putty form, for making tight joints in structural iron or steel work, filling up rivet heads, seams and uneven places, on plates of iron or steel. Also for placing or resetting glass in metal skylights and for making tight joints between iron work and concrete foundations. Pages 88 to 97

SMOOTH-ON IRON CEMENT, No. 7.

In RED Labeled Cans and Sheet Iron Holders.

SMOOTH-ON Iron Cement No. 7 is a hydraulic iron cement prepared and sold in powder form, applied alone or in combination with Portland Cement or with Portland Cement and Sand.

For waterproofing, dustproofing, oilproofing, and hardening concrete floors, walls or roofs.

Partial description of this cement on pages 98 and 121. For full description send for our SMOOTH-ON Instruction Book No. 7.

SMOOTH-ON IRON CONCRETE PAINT.

SMOOTH-ON Iron Concrete Paint is a fluid preparation of SMOOTH-ON Iron Cement for surfacing concrete to prevent dusting, to waterproof and increase wearing quality. Pages 122 and 123. Also used on wood and iron.

SMOOTH-ON COATED CORRUGATED IRON GASKETS.

They are unequaled for withstanding steam, water, gas, or oil. They make the best flanged joints for any pressure or temperature. Used by the largest power plants in the world. Full descriptions on pages 124-137.

SMOOTH-ON No. 1 HOUSEHOLD PACKAGE.

There are many household uses for SMOOTH-ON Cement No. 1, the following are a few, such as stopping leaks in boilers, furnaces, stoves, radiators, iron pipes, water jackets, kettles, iron pots, repairing umbrella handles, cane handles, knife handles, etc. Sold in 6-ounce cans by hardware and supply stores.

Page 44.

SMOOTH-ON MOTOR REPAIR PACKAGE.

For Motor Repairs—Pages 138-141.

SMOOTH-ON IRON CEMENTS

No. 1 and No. 2.



BLUE LABEL

Trade Mark Reg. U. S. Pat. Off.

For repairing leaks or breaks in iron or steel castings, pipes, etc. For making connections, such as steam, water or fire joints. No. 1 quick hardening. No. 2 slow hardening and hydraulic. Applied as a paste or putty.



Sold in 6 oz., 1, 5 and 10 Pound Blue Labeled Tin Cans, like the above. And in 25, 50 and 100 lb. kegs as shown opposite.

SMOOTH-ON No. 1 and No. 2.

SMOOTH-ON Iron Cements No. 1 and No. 2 are chemically prepared iron compounds made and sold in a powder form and used by mixing with water to the consistency of stiff putty.

When in this putty state, they must be applied immediately, because the metallizing action of these cements is rapid, acting without heat, and in a few minutes the putty will get too stiff to work or manipulate. In a few hours they metallize as hard as iron, No. 2 slower than No. 1, and become a part of the metal to which they are applied.

SMOOTH-ON Iron Cement No. 2 is semi-hydraulic, which makes it valuable for quick repairs in damp places. After this cement has set, its hardening is hastened by sprinkling with water. It may be used in a dry place by sprinkling with water two or three times after it has set. SMOOTH-ON Iron Cement No. 1 hardens and metallizes best in a dry place. These cements must be applied to cold metal to get the best results.

If unconfined while metallizing these cements expand in bulk and it is this action that makes them valuable for many mechanical uses, such as repairing leaks or breaks in castings. When metallized they expand and contract the same as the metal.

One pound of SMOOTH-ON Iron Cement No. 1 or No. 2 will fill 10 cubic inches.

APPLICATION

When applying SMOOTH-ON No. 1 or No. 2 to a seam, crack or hole it must be calked or forced into the opening, so the cement will have the walls of the crack or opening to expand against, as the expansive action in these cements is what makes the joint tight, and we caution you not to plaster the cement over the crack on the outside surface, as it prevents the cement in the crack from metallizing, and so takes longer to make a tight joint. These cements must be applied to cold metal, and allowed to thoroughly metallize before heat or pressure is turned on.

All rust and foreign matter must be thoroughly removed from all surfaces, and the surfaces thoroughly dried, before applying SMOOTH-ON Iron Cement No. 1 or No. 2.

A clean rough surface is much better for SMOOTH-ON than a clean smooth surface.

GENERAL DIRECTIONS FOR MIXING AND APPLYING SMOOTH-ON IRON CEMENT No. 1.

TAKE the desired amount of compound, mix with it water in bulk proportions of one of water to six of compound No. 1, which, when thoroughly worked or mixed, will become a stiff putty. In mixing this cement measure out sufficient dry cement to do the work and add the water to it. At first the compound repels the water and the first impulse of the inexperienced user is to add more water. Keep stirring the compound as measured 6 to 1, and it will soon become a stiff putty. If a different consistency is desired, then add more water or compound, as the conditions may require.

CAUTION.

Thoroughly remove all oil, grease or paint from the part to which SMOOTH-ON is to be applied. A clean rough surface is much better for SMOOTH-ON than a clean smooth surface.

GENERAL DIRECTIONS FOR APPLYING SMOOTH-ON IRON CEMENT No. 1 OR No. 2 TO A CRACK.

1. Carefully clean out all foreign matter.
2. Open the crack, if possible.
3. Completely fill the opening with the cement mixed to a proper consistency.
4. Secure the sides of the crack by permanent bolts or clamps to keep the crack from spreading.
See page 16.
5. Where the cement has to withstand very high pressures, the cracks should be covered with a patch. See page 54.

DIRECTIONS FOR MIXING AND APPLYING SMOOTH-ON IRON CEMENT No. 2.

TAKE the desired amount of Compound, for use as a stiff putty, mix it with water in bulk proportions of one of water to four of SMOOTH-ON Iron Cement No. 2, which when thoroughly worked will become a stiff putty, in which state it may be pounded or forced into cracks or openings. For a thin putty mix three parts of SMOOTH-ON No. 2 to one part of water by bulk. For a paste consistency mix two and a half parts of cement to one part of water by bulk. When mixing SMOOTH-ON Iron Cement No. 2 to any of the above consistencies work the cement thoroughly or it will not metallize evenly. A few hours after SMOOTH-ON Iron Cement No. 2 has been applied the metallizing is hastened and its hardening increased by sprinkling or dampening with water. This may be repeated two or three times, especially if the cement is in a dry place.

USES FOR SMOOTH-ON IRON CEMENTS No. 1 and No. 2.

1. **Stopping** leaks of steam, water, gas or oil.
2. **Repairing** spongy spots in iron castings, to make them steam or water-tight.
3. **Repairing** cracks in iron or steel castings.
4. **Making** sleeve joints in leaky flanged connections. See pages 18-19.
5. **Stopping** leaks in boilers and furnaces, cracked fire pots, etc.
6. **Stopping** leaks in wrought or cast iron pipe.
7. **Making** water-tight joints, between the ends of steel plates.
8. **Repairing** flanged joints.

SPECIAL FEATURES OF SMOOTH-ON IRON CEMENT No. 1.

1. It must be applied as a putty, too much water will make it crumble.
2. It must be applied to cold, dry metal.
3. It metallizes quickly.
4. When hard it has the color of cast iron.
5. It is used in combination with SMOOTH-ON Elastic Cement for boiler patching.
6. It expands in bulk while metallizing.
7. When fully metallized it will withstand fire, steam, water, oil or gasoline and the expansion and contraction being the same as iron it insures a tight joint at all temperatures.

SPECIAL FEATURES OF SMOOTH-ON IRON CEMENT No. 2.

1. It may be applied as a paint, paste or putty.
2. It is very slow hardening.
3. It is hydraulic, which makes it valuable for use in damp or wet places.
4. The hardening and metallizing of this cement is hastened by sprinkling with water shortly after its application.
5. It may be applied with a brush as a stiff paint by mixing $2\frac{1}{2}$ parts of cement to one part of water. This mixture may be drawn into small openings with vacuum on cold work (the same as SMOOTH-ON Elastic Cement on hot work) and it stops the leak every time.
6. It is valuable for use in places where the cement cannot be used as a putty but must be used as a paste and flowed or run into the defective part (such as the leg of a boiler). This is accomplished by mixing $2\frac{1}{2}$ parts of cement to one part of water.
7. SMOOTH-ON Iron Cement No. 2 is valuable for pounding into the pores of spongy iron or steel castings, pipes, etc., as the cement is very slow-hardening and gives ample time for the application. This application is made by mixing 4 parts of cement to 1 part of water. This, when thoroughly worked, makes a very stiff putty which gradually becomes a crumbly mass, in which state it is ready for use. Then dampen the spongy iron or steel with water and caulk the mixed cement into the spongy parts. A few hours after the application, dampen or wet the repaired parts with water. This will hasten the metallizing or hardening of the SMOOTH-ON Iron Cement No. 2. It will be like solid metal in a few days.

Application

When applying SMOOTH-ON to cracks, seams or holes, the cement must be caulked or forced into the opening, so the cement will have the walls of the crack or opening to expand against, as the expansive action in this cement is what makes the joint tight, and we caution you not to plaster the cement over the crack on the outside surface, as it prevents the cement in the crack from metallizing, and so takes longer to make the joint tight.

1. All rust and foreign matter must be thoroughly removed from the crack and the crack thoroughly dried before applying SMOOTH-ON. Remember a clean rough surface is much better for SMOOTH-ON Cement than a clean smooth surface.
2. For a fine crack, open it if possible to 1-64 in., keeping the sides of the crack parallel, and use SMOOTH-ON Elastic Iron Cement No. 3, made to the desired consistency with SMOOTH-ON Iron Cement No. 1 Powder, mixing it as per directions.
3. Heat the crack and surrounding metal, with a gasoline torch, or if a motor by running the engine, or by live steam, or by any other method, until the defective part is hot, also heat the SMOOTH-ON Elastic Cement when mixed ready for use.
4. Apply the heated SMOOTH-ON Elastic Cement to the heated crack, with a putty knife, then caulk the cement into the crack using a caulking tool that will just enter the crack. Keep applying the cement and caulking it in, until the crack is full, then smooth even with the surface and allow the cement to harden.
5. If the defective part has been heated sufficiently, hot the cement will harden rapidly, as heat hastens the hardening of SMOOTH-ON Elastic Cement.

6. When the cement is hardened the repaired part is ready for use.
7. The action of SMOOTH-ON is a slight expansion in hardening. This action completely fills any opening into which the cement is forced and if the crack is of sufficient depth to hold the cement the repair will be a lasting one.
8. When this method will not hold, then apply a patch to hold the cement in place, as per directions pages 54 and 55.

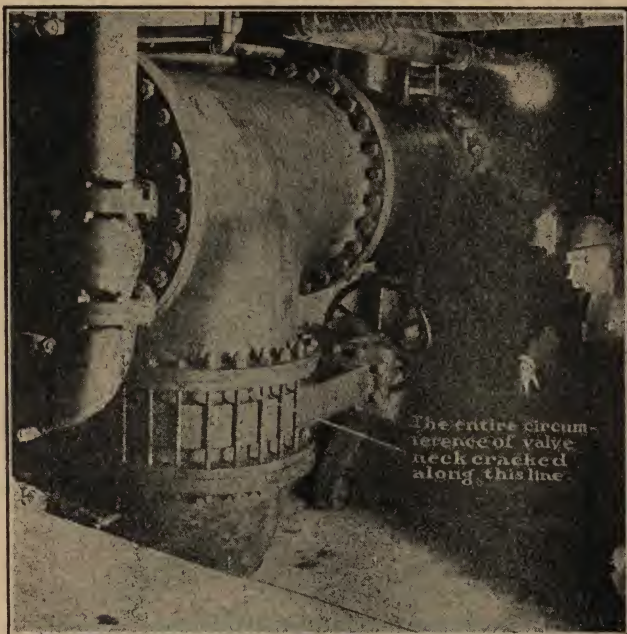
For a wide Crack of 1-32 in. or More

Use SMOOTH-ON Iron Cement No. 1 or No. 2, mixing it with water to the consistency of stiff putty as per directions. These cements must be applied to cold metal. Clean the crack and apply the cement the same as you do to the fine crack, caulking it in with a tool, made to just enter the crack, keep applying and caulking the cement in, until the crack is full. Directions for mixing the SMOOTH-ON Iron Cements No. 1 or No. 2 are found on pages 10 and 11.

The caulking tools used for caulking SMOOTH-ON Cement must not be drawn to a sharp edge or point, because when caulking the cement such a tool will not force the cement in the leak or crack, but will simply drive through the cement. It is necessary, therefore, that all SMOOTH-ON caulking tools have a flat edge or point, one just smaller than the diameter or width of the crack or seam. Such a tool will drive the cement into the crack or opening, completely filling it.



GATE VALVE REPAIRED.



The following letter speaks for itself:

South Side Elevated R. R. Co.
Power House, 40th and State Sts.,
Chicago, Ill., April 10, 1908.

Smooth-On Mfg. Co.,
Jersey City, N. J.

Gentlemen:—This photograph was taken from a 30-inch Gate Valve which is in the 30-inch suction line for the Condensers. This valve cracked all around under the top flange. I cleaned the crack, filled it with SMOOTH-ON IRON CEMENT No. 1, put the rods across as shown in photo, and drew it together. This was done about two years ago, and it has been as good as new ever since. SMOOTH-ON is a very useful article in a power plant, and I would not think of being without it. Yours very truly,
(Signed), A. L. HADEN, Chief Engineer.

**CRACKED PUMP REPAIRED WITH SMOOTH-ON
IRON CEMENT No. 1, AT U. S. NAVY YARD,
NEW YORK CITY, U. S. A., 10 YEARS
AGO, AND STILL IN USE.**



Cut No. 1.

**Report of the Repair given by the Engineer in Charge, in the
Department of Construction and Repairs.—See next page.**

REPORT.

January 15, 1903.

SMOOTH-ON MFG. Co.

About four years ago one of our 45-inch centrifugal pumps split almost in two, due to a sudden strain. The crack was over twenty feet long and in some places opened up three-quarters of an inch. To replace this pump would take months, and we needed it badly. This fracture was repaired with SMOOTH-ON Iron Cement No. 1, and the pump running on the third day after the break, and ran successfully for thirteen months, when it was replaced by a new pump. This pump (Cut No. 1) broke about one and one-half years ago and was repaired with SMOOTH-ON as was the first pump, and has not given us any trouble since. (Cut No. 1 shows the pump as now in use; the fracture extends from A through B to C and from C to D; patches 1, 2 and 3 are brass; straps 4, 5, 6 and 7 are of wrought iron; SMOOTH-ON was used in fractures and under patches and straps.)

When the new pump (Cut No. 1) was placed, the flanges connecting the gate valve with the pump did not come in line by two and a half inches; to make this joint, the pump flange was cut off, a plate of wrought iron was flanged and shaped to fit the interior of the main and bolted to it, so the flange fitted the flange of the gate valve; both the flange joint and the joint between the main pipe and the inserted flange sleeve were made with SMOOTH-ON. Cuts on pages 18 and 19 show the flanged joint and inserted sleeves to better advantage.

The suction pipe to this pump broke in two, underground, due to settling of the ground, over three years ago. This was also repaired with SMOOTH-ON and has never given trouble since. I have had at least a dozen more of these breaks, and after repairing them with SMOOTH-ON have never had any trouble with them.

SLEEVE AND FLANGED JOINT.

These cuts show the right and left side of the main duct of the 45-inch centrifugal pump (shown on page 16) where it is joined to the gate valve. When this new pump was placed into position the flanged face



on the end of the pump's main duct and the flanged face connection of the stationary gate valve did not come into line by $2\frac{1}{2}$ inches (as shown by the cuts) making it impossible to make the connection in the usual way. The joint was made as follows:

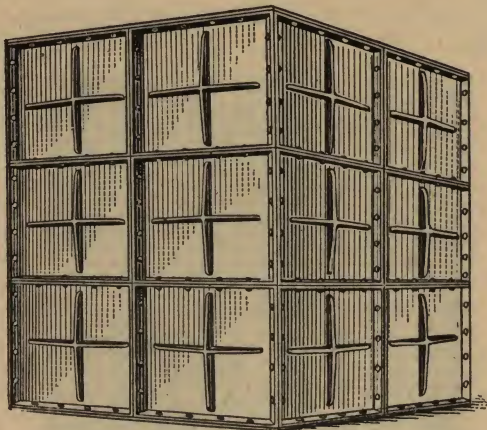
SLEEVE AND FLANGED JOINT.

The flange of the new pump was cut off, a plate of wrought iron was shaped to fit the interior of the main duct and bolted to it, as shown by the arrows. The other end of the plate was flanged to fit the flanged



face of the gate valve, as shown in the cut and bolted to it. Both joints were made with SMOOTH-ON. This pump has been in continual use for ten years, being subjected to severe service, and the joints made with SMOOTH-ON are giving perfect satisfaction.

IRON OR STEEL TANK JOINTS.



FOR making tight joints on the seams of cast iron or steel tanks (flange or lap joints) excellent results are obtained by using SMOOTH-ON Elastic Cement and SMOOTH-ON Iron Cement No. 1, mixed to a stiff putty as per directions. Page 48.

This combination makes a stiff putty easy to work and apply. It is applied to the flange or lap seam faces with a trowel or putty knife. It completely fills uneven places, and will adhere firmly to the surfaces even before it has metallized, so the plate or casting may be handled without fear of the SMOOTH-ON dropping off. This combination metallizes slowly, giving plenty of time for applying and putting together of the plates or castings. While metallizing it expands slightly and this action makes a tight joint. When metallized it will withstand fire, water, steam or oil.

Many of the largest tank builders use this combination on all new work.

CRACKED HYDRAULIC CYLINDER.

MACFADDEN SANATORIUM,
BATTLE CREEK, MICH., 3, 31-'09. }

SMOOTH-ON MANUFACTURING Co.,
Jersey City, N. J.

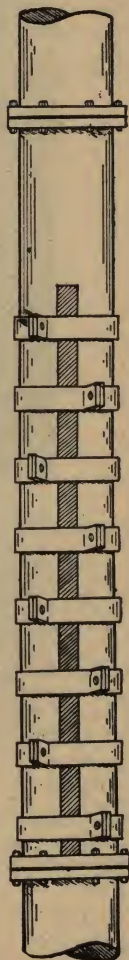
Sirs:—I feel compelled to tell you of the great success I had with your SMOOTH-ON Cement in repairing a crack 4 ft. 6 in. in length in one of the sections of a vertical cylinder belonging to a passenger elevator operating under a tank pressure of 125 lbs. gauge. The crack was the result of a freeze-up during a time when the building was tenantless, the cylinder having been left full of water. Having tried various methods without success I decided to test the claims made for your cement.

That the results have been far more than I expected goes without saying, for you, of course, know what your preparations are capable of. My method of applying the cement was very simple. I made the paste of the right consistency to jam tightly into the crack and then left a strip of the cement about an inch wide and about an eighth of an inch thick on the outside. I then placed over this a strip of boiler plate two inches wide, which I had bent to the radius of the cylinder. This strip is held in place by the eight heavy clamps I had made as a protection to the cylinder. The clamps are spaced at equal distance down the length of the crack, the joints being staggered at either side of the strip of the boiler plate. I put on the clamps before the cement was quite dry, which caused it to spread out in a thin layer under the strip of the boiler plate.

It is now almost a year since the repair was made, and there is not the least sign of a leak, in spite of the hard service to which the machine is constantly put. I have found nothing to equal SMOOTH-ON for leaky steam-pipe joints. It does the trick every time. Wishing you every success,

I am truly yours,

ROBT. TOMLINSON.



REPAIRING STEAM FLANGED JOINT.



A is the joint repaired.

THE SMOOTH-ON MFG. CO., Jersey City, N. J.

Gentlemen:—I am happy to say that your SMOOTH-ON Compound proved a perfect success on that very bad joint we had on the dome of our boiler, from which a great many branches run.

It would have cost from \$12 to \$15 to take the header off and make an ordinary joint. I simply took the engineer's packing hook and picked out part of the old joint, which was $\frac{3}{32}$ in. thick for $\frac{3}{8}$ in. inside of the flange, all around, and put in your Compound.

It took a man $1\frac{1}{2}$ hours to pick out the part of the old joint, and half an hour to mix and put in your Compound, which he did with a common table knife, and to our surprise next morning we had a perfectly tight joint. I must say it is the best and handiest material I ever saw for that purpose, and would recommend every engineer troubled with leaks to try it.

THE COCKBURN BARROW & MACHINE CO.

Office, 240 11th St., Jersey City.

Wm. McIlvrid, Supt.

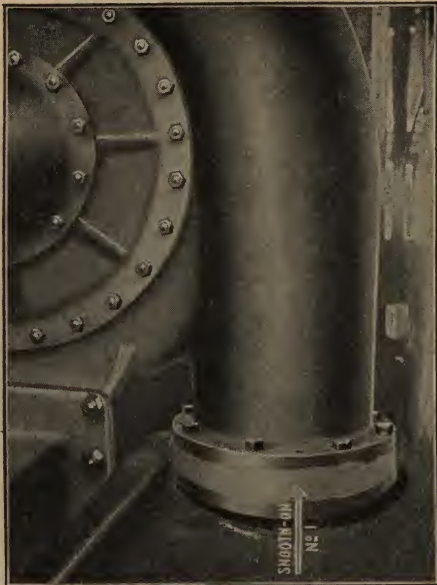
Stopping Leaks in Tank Seams.

Cut shows an iron tank standing on end to show interior and comparative size. This tank is used for holding lubricating oils. It leaked in seams and rivets; caulking and solder was tried unsuccessfully.



SMOOTH-ON Iron Cement No. 1 was forced into the wide openings and SMOOTH-ON Elastic Cement into the fine openings. The cements were then allowed to harden. The tank has been in use over a year and is perfectly tight.

A FLANGED JOINT MADE POSSIBLE.



GENERAL OFFICES

NEW YORK AND QUEENS ELECTRIC LIGHT AND POWER COMPANY,
ASTORIA, N. Y., October 21, 1910.

SMOOTH-ON Manufacturing Company, Jersey City, N. J.

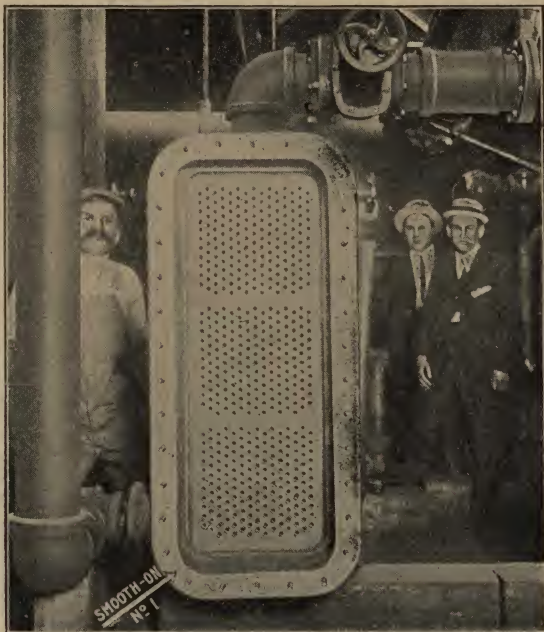
About one year ago we installed a centrifugal pump and had great difficulty in making the necessary connections, owing to an 18" pipe and flange projecting through the concrete floor (which was installed some five years ago), being out of level.

The pipe and pump flanges did not square up to within $2\frac{1}{2}$ " (see cut), and both flanges were rigid.

We tried a bevel dutchman with a soft rubber gasket between each flange. This failed. Your Mr. Googins called and recommended SMOOTH-ON Iron Cement No. 1. The bolts and nuts were put in place and made fast, then SMOOTH-ON mixed to a very stiff putty was applied to the flanged faces until all open space between them was filled (see cut.) This was allowed to harden. The expanding action of the SMOOTH-ON made the joint tight, and it is still tight.

A. WITHERELLS, Supt. of Mfg.

STEAM CONDENSER MADE TIGHT.



NEW YORK ICE CO., 140 Cedar Street.
New York, August 2, 1912.

SMOOTH-ON MANUFACTURING Co.,
Gentlemen:

Lately one of our steam condensers developed a bad leak between tube sheet and shell, and on disconnecting it we found the gasket face badly eaten away.

After trying to make a perfect joint with rubber gasket, we found it impossible, due to imperfect face and edges of casting.

To overcome this trouble, we filled the imperfect places with SMOOTH-ON Iron Cement No. 1, making a smooth, hard surface for the gasket. After letting the cement set for 36 hours the gasket was replaced, the joint tested and it has been tight ever since.

Yours respectfully, THE NEW YORK ICE CO.,
A. R. Lawrence, Supt.

BOILER AND TANK REPAIRS:

S. S. "Santuit,"
NORFOLK, Va., Jan. 16, 1901.

HERBERT B. SAUNDERS, Esq.,
New York, N. Y.

Dear Sir:—In answer to yours of Jan. 4th, I wish to state that SMOOTH-ON Compound is the very best cement that I have ever used, and I can safely say that had I been without it I could not have continued with boilers without considerable interruption; and furthermore state that during my experience of 30 years in ships of several nations, I have never found anything to equal it, and I can without hesitation safely recommend it to anyone troubled with leaky boilers, as I am positive that if they give SMOOTH-ON Compound a fair trial they will receive the same good results from its use that I have.

Yours faithfully,

A. CARLSEN, Chief Engineer,
S. S. "Santuit," Norfolk, Va.



From
GEO. FRASER & SONS,
Limited,
ENGINEERS, ETC.

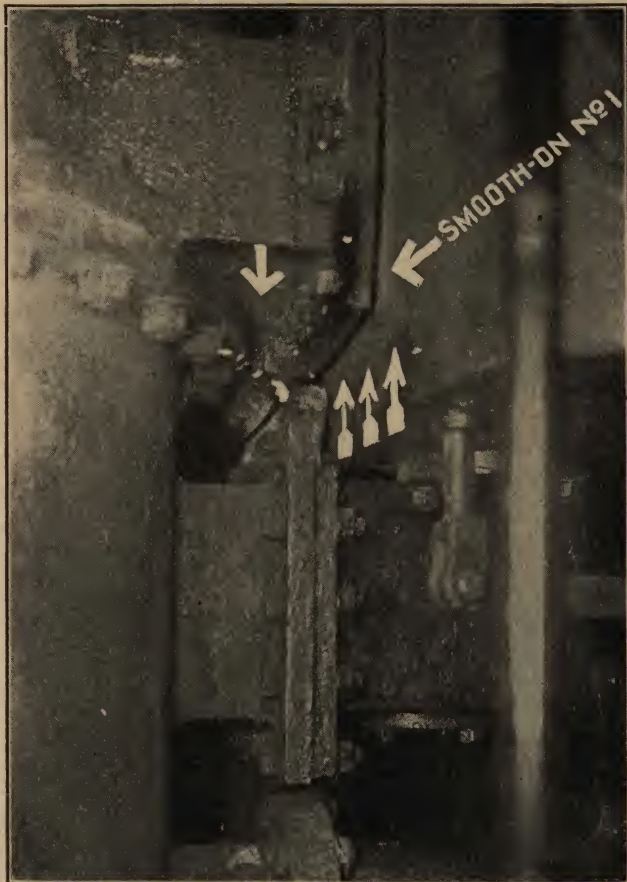
AUCKLAND, N. Z., 8 Dec., 1905.

MEMO. TO SMOOTH-ON MFG. Co., Jersey City, N. J.

Please send us your 60-page illustrated book. We have had great success with your cements in connection with some very intricate repairs to ships, reserve tanks, marine and stationary boilers and on air compressors working up to 1,400 lbs. pressure.

Yours respectfully,

J. E. FRASER,
Geo. Fraser & Sons Co.

STEAM NOZZLE JOINT MADE TIGHT.

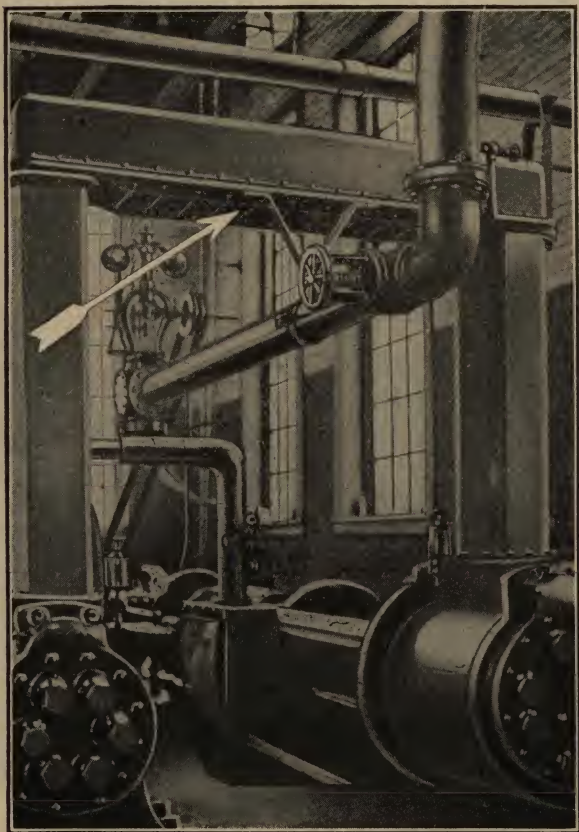
THE SMOOTH-ON MFG. CO.,
Gentlemen:

Hoboken, N. J., October 24, 1914.

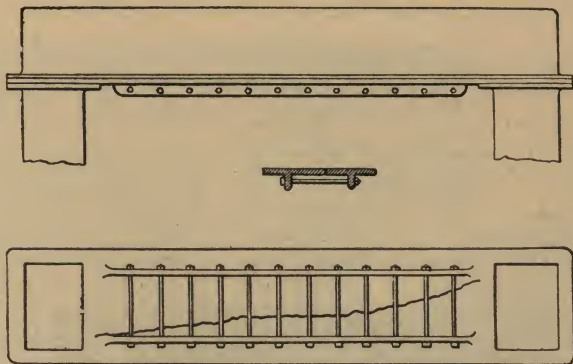
I wish to advise that we were having considerable trouble keeping the steam chest nozzle tight on one of our Ferry-boats, and it would have been necessary for us to take down the entire front of the engine and remove the steam chest, but by the use of your No. 1 SMOOTH-ON Cement, the joint was made tight and, therefore, saved us considerable time and expense.

Yours truly, John M. Emery, Supt. Marine Dept.

INTER COOLER REPAIRED.



For description of repair see next page.

INTER COOLER REPAIRED.

Havre, Mont., May 25, 1910.

SMOOTH-ON MFG. Co.,
Jersey City, N. J.

Gentlemen:

We have been convinced by our first trial that no cement can equal SMOOTH-ON Iron Cement No. 1. The intercooler on a 12" by 22" twin steam, two stage air compressor had a crack over five feet long and had opened up $\frac{1}{8}$ ". The accompanying sketch and photograph will show at a glance just how the repair was made.

The two ribs shown in cut were spaced to receive twelve one-half inch bolts, which were drawn taut after applying SMOOTH-ON. We have been running two weeks without the least sign of a leak and can gladly say that we are more than pleased with the results obtained.

Yours truly,

FRANK W. BILLINGER,

Chief Engineer,

G. N. Ry. Power House, Havre, Mont.

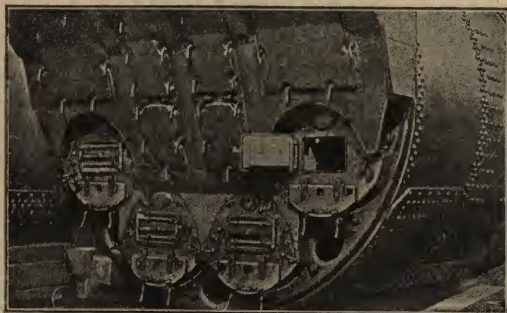
BOILER SEAMS MADE TIGHT.

Halifax, N. S., May 1, 1903.

SMOOTH-ON MFG. Co.,
Jersey City, N. J.

Gentlemen:

Your favor of 6th ult. duly to hand. We have used your SMOOTH-ON No. 1 and SMOOTH-ON Elastic Cement for some months. I asked Crowell Bros., our hardware people, to send for them. I told an engineer to try the cement on anything where it was not going to get him in trouble, *i.e.*, anything that it is not specially recommended for. One engineer whose



ship recently got new boilers, writes me, stating it is great stuff, and if he had only had a ton of it when he had the old boilers they would be in the ship yet. However, I am going to put it in all our steamers.

Several people have been inquiring about the cement. I told them where we got it, but Crowell keeps none on hand. I think after we have fully tested it, we will get them to keep a supply.

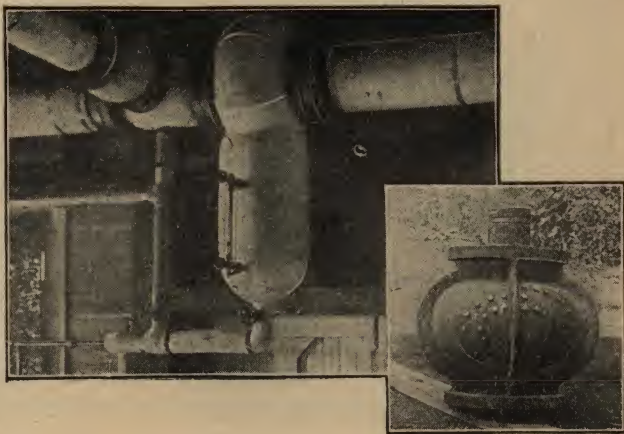
Please send me, as you suggest, your illustrated booklet.

I have had several, but have always given them away to boilermakers, etc.

Yours very truly,

J. J. EWING, Superintendent,
Pickford & Black.

STEAM SEPARATOR REPAIRED.



Conway, N. H., Sept. 19, 1914.

SMOOTH-ON MFG. CO.,
Jersey City, N. J.
Gentlemen:

I enclose photo of a repair job on an 8 inch Cochrane live steam separator. This separator cracked across the top in two places. I formed two patches of $\frac{1}{4}$ inch boiler iron and put them on with tap bolts, using No. 1 SMOOTH-ON under the patches, and the result was a tight job. I also have a 300 H.P. engine that has a crack on top of steam chest 8 inches long that was repaired the same way by using SMOOTH-ON under a patch. This engine has been worked hard for two years with no sign of leakage. Hoping this may be interesting, I am,

Yours truly,

Seth Berry, Chief Engineer.

Conway Lumber Co., Conway, N. H.

JACKETED INK KETTLE REPAIRED.

FRANK T. MORRILL & COMPANY,
17 Vandewater Street.

New York City, N. Y., June 5, 1909.

SMOOTH-ON MFG. CO.,
572 Communipaw Avenue,
Jersey City, N. J.

Gentlemen:

We are only too pleased to say that SMOOTH-ON is the greatest ever and we are simply delighted with it. You may be interested to know that we took this kettle and had it sent to New York at an expense of Thirty-five Dollars, but we had to ship it back, as the thing was an utter failure. We then tried your SMOOTH-ON Iron Cement No. 1 and SMOOTH-ON Elastic Cement, which did the business.

Again thanking you for the courtesy shown us and assuring you that if there is anyone in our neighborhood who is interested in your material, we shall be very glad to show them what fine results SMOOTH-ON has given us, we beg to remain,

Faithfully yours,

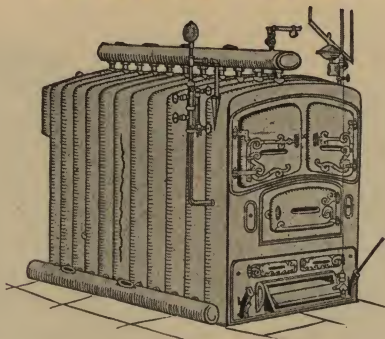
FRANK T. MORRILL & CO.,
Frank T. Morrill

SMOOTH-ON WITHSTANDS FIRE.



Many engineers ask, will SMOOTH-ON withstand direct furnace heat? The illustration at the top of this page will give an idea of how well SMOOTH-ON Iron Cement No. 1 can withstand intense heat. It shows a pipe flange which was bolted together; the pipe line during a fire dropped in a bed of hot coals, the lower flange was entirely melted away; the SMOOTH-ON with which the Joint was packed is shown along the line, a, b, c, and protected the upper flange so that it was practically undamaged except on one edge (in the picture the undamaged flange is shown underneath). This test proves the value of SMOOTH-ON to withstand fire.

A CRACKED SECTION.



To make this repair, carefully clean the crack, opening it up if possible, as explained on page 10.

A. For a fine crack use SMOOTH-ON Elastic Iron Cement No. 3.

B. For a wide crack use SMOOTH-ON Iron Cement No. 1 or No. 2

N. B.—If the crack is near the top of the boiler, fill the boiler with water up to the crack, allowing it to run out during the repair; this will cause a partial vacuum and suck the cement into the leak.

A. For a fine crack. Heat the crack with a torch until it is very hot, also warm the cement, mixing it as per page 48 for a slow or quick hardening putty. Then caulk the mixed cement into the leak, with a caulking tool. When the crack has been forced full of cement allow it to harden, which will be hastened by heating the metal around the crack.

B. For a wide crack. Use SMOOTH-ON Iron Cement No. 1 or No. 2, mixing them as per directions on pages 10 and 11 and apply them as per page 13

PHIPPS POWER PLANT.

Smooth-On Mfg. Co.,
Jersey City, N. J.

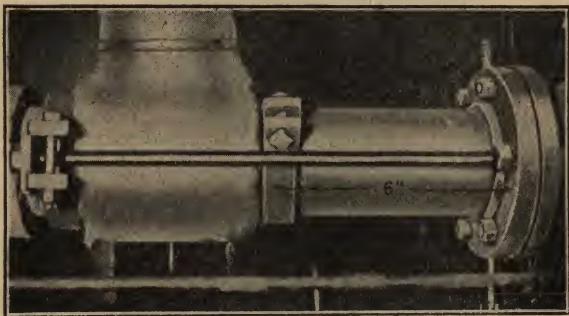
Pittsburgh, Nov. 8th, 1909.

Gentlemen:—Sometime ago, we discovered a very bad leak on one of our 60-ton accumulators, due to a spongy steel casting. We tried pouring in these holes babblitt metal without success. We bought 200 lbs. of your No. 2 Smooth-On, and after applying it according to your directions, it has proved very satisfactory, withstanding a water pressure of 850 lbs. per square inch.

Yours very truly,

PHIPPS POWER PLANT,
per John Hyde.

GAS ENGINE EXHAUST PIPE REPAIR.



Shows how SMOOTH-ON No. 1 withstands heat.

Pittsburgh, Pa., July 20, 1909.

SMOOTH-ON MFG. CO.,
Jersey City, N. J.

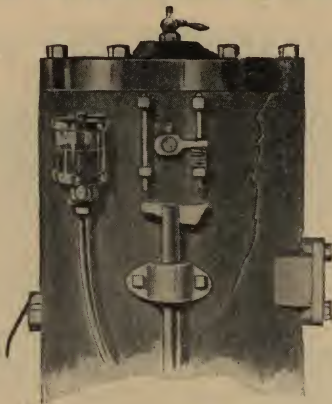
Gentlemen:

I herewith enclose a small photograph of a pipe repair made with SMOOTH-ON No. 1 on the exhaust pipe of a gas engine in the engine room of the Keystone National Bank Bldg., Pittsburgh, Pa.

The photo shows a short six inch nipple leading from the flange of a 125 H.P. Westinghouse gas engine to a six inch tee in the exhaust riser. The threads on the nipple and in the tee became so badly corroded that the nipple slipped out of the tee, leaving an almost smooth surface without threads. A new nipple was secured and the threads filed down so that it would partly enter the tee. Both the end of the nipple and the inside of the tee was then given a heavy coat of SMOOTH-ON and then pulled into place with the clamp; the small clamp around the pipe was put on to hold the paste up close to the fitting. After a year's run it has not shown any signs of leaking.

Yours very truly,
L. M. JOHNSON, Chief Engineer.

CRACKED WATER JACKET REPAIRED.



PITTSFIELD, Nov- 17, 1909.

SMOOTH-ON MFG. CO.

Gentlemen:—In looking over your ad. in *Power*, I see you would like a description of what SMOOTH-ON will do. I will tell you what it has done for me.

I had a marine engine and going home one night I forgot to draw the water from the cylinder and in the night it became very cold and froze the water, bursting my water jacket from top to bottom. I dressed the crack down with a file, applied SMOOTH-ON, and can say it has never leaked one drop from that day. It was such a neat job it could not be detected by the eye after being painted over.

I will always say a good word for SMOOTH-ON as that is not the first time it has proven itself the real thing.

Yours truly,

WILLIAM T. SPRAGUE,

223 Francis Avenue,
Pittsfield, Mass.

BROKEN WATER JACKET REPAIRED.



This cut shows a repair made by John J. Corcoran of Worcester, Mass. The jacket of the cylinder had a piece about 3 in. x 4 in. broken out of it by water freezing in it.

Mr. Corcoran says: "The cheapest price which any one would braze or weld this same job was \$5.00. I repaired it with half a can of SMOOTH-ON for 25c. I used set screws to prevent the piece from falling through and the straps to steady it, as the engine is of high horse-power, and being a single cylinder the vibrations are very great, thus making these precautions advantageous, although perhaps not necessary. I have also mended my stationary gas engine with your Compound and, in that case, straps were not necessary. Each repair is giving satisfaction.

To Repair a Crack in a Water Jacket.

- 1st. Carefully clean the crack and surrounding metal, removing all oil and grease.
- 2nd. FOR A FINE CRACK, use Smooth-On Elastic Iron Cement. FOR A WIDE CRACK, use Smooth-On Elastic Iron Cement, stiffened with Smooth-On Iron Cement No. 1 or No. 2 to the consistency of stiff putty, as per page 48.
- 3rd. Heat the crack and surrounding metal with a gasoline torch or by running the engine until the defective part is about 300 degrees Fahrenheit.
- 4th. Apply the Cement to the heated crack, with a putty knife or caulking tool, forcing it into the crack until it is full. Then allow it to harden. If the defective part has been heated sufficiently hot, the cement will harden rapidly.

Heat hastens the hardening.

- 5th. When the cement has hardened, or metallized, the repaired part is ready for use.

The action of Smooth-On is a slight expansion in hardening. This action completely fills any opening into which the cement is forced, and if the crack is of sufficient depth to hold the cement, the repair will be a lasting one. When this method will not hold apply a patch to hold the cement as shown on page 54. This shows a general method for applying a SMOOTH-ON Patch.

LEAKY RADIATORS.

May be repaired as follows:

Withdraw the water from the radiator.

Then apply Smooth-On Iron Cement No. 1 mixed with water and Smooth-On Elastic Cement, as a quick hardening putty, as per directions page 48. Warming hastens hardening of the cement.

How to Repair a Cracked Water Jacket by Vacuum

The following received the first prize in the prize contest awarded by the automobile magazine MOTOR, appearing in its issue of February, 1912.

Use a Vacuum Cleaner

The Prize-Winning Answer

If the fracture is readily accessible, the removal of the engine from the chassis is unnecessary. Remove with gasoline all oil, etc., from the fracture and surrounding metal. Plug the water-jacket inlet and to the water outlet attach the end of the rubber suction pipe of an ordinary hand vacuum cleaner.

Mix up a rather stiff paste consisting of two-thirds of SMOOTH-ON Elastic Iron Cement (paste) and one-third SMOOTH-ON Iron Cement No. 1 (powder). Run your engine until the crack and surrounding metal is pretty well heated, and then with a common table knife in one hand, apply the iron-cement paste to the crack, a little at a time, while the other hand operates the handle of the vacuum cleaner, which sucks the cement into the crack. This suction can be easily regulated to suit the width of the fracture; and as the fine part of the fracture requires more suction force to fill it, this part should be treated first, letting up on the suction as the fracture widens. Apply the cement paste a little at a time, until the fracture is completely filled.

The filling process cannot be done with the aid of the knife alone, especially if the fracture is fine. A hand vacuum cleaner can be rented a whole day for a dollar.

After the cement is in, disconnect the vacuum cleaner from the engine, and spread a layer of the cement over and around the fracture, smoothing it down flush to conform to the general contour of the water-jacket.

Run the engine at intervals, as heat hastens the hardening of the cement, which becomes about the same color as the casting itself.

If, in the first place, it is found that the fracture to be treated is not accessible, remove the injured member from the chassis, and proceed as above directed, except that the preliminary heating of the fracture and surrounding metal will have to be done with a blow-torch. Heat to a temperature of about 300 degrees. A lower heat than this is better for drying the cement after it is in, such as the heat from a furnace register or steam pipes.

After the cement has become perfectly hard, run a stream of water from the faucet through the water-jacket as a test before returning the repaired member to the car.

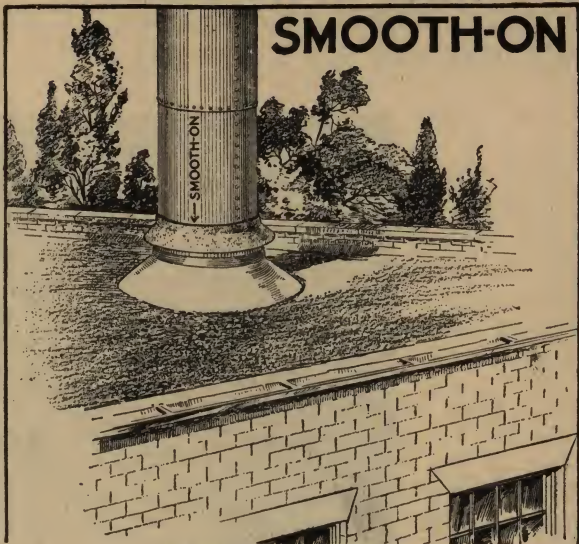
I have successfully used the above method on one of the badly cracked water-jackets of my runabout, which since has been run about six months. The repair is still tight.

This method entirely eliminates the fear incident to any of the welding processes where the heat is likely to more or less warp the cylinder bore and valve seats, thereby causing loss of power through reduced compression. It also obviates the tedious labor of valve grinding, as the welding heat is always sure to cause a heavy scale to form on the valve seats.

GEORGE F. WHITE,
Bridgewater, Mass.

SMOKE STACK JOINT

SMOOTH-ON



CARRIER LOW COMPANY.

Joliet, Ill., September 15th.

SMOOTH-ON MFG CO., N. J.

Gentlemen: About 5 years ago I took charge of the above plant. We had two return-tubular Boilers and above them about twelve feet of stack to the roof of the Boiler room. We had trouble as the heat from those stacks would set off the sprinkler heads, so we decided to cover the stack with asbestos covering. This job cost about \$50 and it was \$50 thrown away, as we found it impossible to keep the stacks from leaking at the roof. I packed the hood around these stacks with everything any one could think of, but the rain and heat would soon rot out the packing, and the water would run down the outside of stack, the asbestos dropping off in chunks; but thanks to Smooth-On Cement the stacks are as tight as a drum, and have been for the past year.

In applying the compound I had a local tinsmith make a galvanized ring to fit around stack about 4 in. deep, as shown in drawing. I set this ring about 1 in. above the large hood on roof and packed it with Smooth-On. The next morning I went up to see how it looked. I was surprised to find a solid iron projection on the stack with not the slightest crack that rain could get in. I have been watching these stacks for the last year, and can say that they have not leaked one drop since that time. I have used your cement in several places where costly repairs would have had to be made, and I can without hesitation safely recommend it to any one troubled with leaks around the power plant.

Respectfully yours, JAMES BROWNING.

A FEW USES FROM THE THOUSAND AND ONE
YOU CAN FIND FOR SMOOTH-ON NO. 1

If you wish to
fasten a step or
handle to a concrete
or brick wall, use
SMOOTH-ON No. 1.

If you wish to
tighten a loose
screw driver handle,
use SMOOTH-ON
No. 1.

If you wish to
tighten the handle
of a hammer, use
SMOOTH-ON No. 1.



A FEW USES FROM THE THOUSAND AND ONE YOU CAN FIND FOR SMOOTH-ON NO. 1



If a bolt needs a washer or lock nut, and you wish a permanent job, use SMOOTH-ON No. 1.

If you wish to imbed expansion sockets in cement, so they will not come out, use SMOOTH-ON No. 1.

If you wish a permanent lock nut, fasten the nut to the bolt by applying some SMOOTH-ON No. 1 to the threads.

SMOOTH-ON IRON CEMENT No. 1

FOR HOUSEHOLD USE.



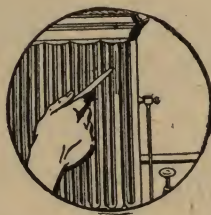
For permanently closing cracks
in furnace fire pots.



For permanently repairing
tin roofs.



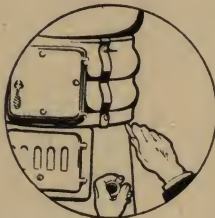
For permanently repairing
sinks.



For repairing leaky steam
radiators.



For repairing lavatory
tanks,



For making boiler joints
permanently gas tight.

Illustrated circular with special directions regarding household repairs, sent upon request.

SMOOTH-ON ELASTIC CEMENT,

No. 3.



10 lb.

5 lb.

1 lb.

GRAY LABEL.

An Elastic Iron Cement, especially prepared for use on all seams of Boilers or Tanks to stop leaks, also for Boiler Patching and for Screw Thread Joints. Applied as a paint, paste or putty. This cement is hardened by heat, and quick results are obtained only by applying it to warm metal, or heating the metal immediately after application.

Sold in 1, 5 and 10 Pound
Gray Labeled Tin Cans,
like the above.

Also $\frac{1}{4}$ -lb. Size for Household Use.

SMOOTH-ON Elastic Cement is made to supply the demand for a cement that is both metallic and elastic.

It is made from SMOOTH-ON Iron Cement No. 1 and is especially designed and prepared for use on all inside seams of marine and stationary boilers and tank work; to stop leaks in seams difficult to caulk and for soft or hard patches.

SMOOTH-ON Elastic Cement is prepared and sold in a paste form ready for use in air-tight cans. The contents of the can must be stirred to an even consistency before being removed; it may then be thickened to any desired consistency by adding to it SMOOTH-ON Iron Cement No. 1 or No. 2 in the powder form, or thinned to any consistency with kerosene or linseed oil. SMOOTH-ON Elastic Cement gets hard very slowly (about like red and white lead putty), but this action is quickened by heat. The slow metallization of SMOOTH-ON Elastic Cement makes it easy to work and apply.

There is no hurrying of the work to get through before the cement gets too stiff or hard to work, because it stays soft and pliable until heated and this does away with all loss of material. All the cement left over is returned to the can for use at some other time.

When applying SMOOTH-ON Elastic Cement and its combination with SMOOTH-ON Iron Cement No. 1 or No. 2 to inside seams and cracks or under a boiler patch, the work may be tested as soon as completed, because the boiler pressure forces the cement into the openings and the heat metallizes it.

One pound of SMOOTH-ON Elastic Cement when applied as a paint will cover $6\frac{1}{2}$ square feet.

One pound of SMOOTH-ON Elastic Cement and SMOOTH-ON Iron Cement No. 1 or No. 2 mixed half and half will fill 10 cubic inches.

SPECIAL FEATURES.

Special features of SMOOTH-ON Elastic Cement and its combination with SMOOTH-ON Iron Cement No. 1 or No. 2.

1. It may be used as a paint, paste or putty.
2. It may be applied to hot or cold metal.
3. It will adhere firmly to surfaces.
4. It will protect steel or iron plates and prevent pitting which makes it valuable for coating the pitted parts of boilers or tanks.

5. SMOOTH-ON Elastic Cement, when hard, will withstand fire, steam, water or oil, and expands and contracts the same as iron, insuring a tight joint at all temperatures.

6. It is very slow to metallize, giving ample time for manipulation on large work.

7. When hard, SMOOTH-ON Elastic Cement may be filed.

USES.

Uses for SMOOTH-ON Elastic Cement, and its combination with SMOOTH-ON Iron Cement No. 1 or No. 2.

Unequalled for stopping leaks on inside seams of boilers or tanks where caulking is difficult.

For permanent joints in the construction of boilers, viz., under main stay brace and screw stay bolt nuts.

For rivet cement work, on boilers or tanks.

For use under boiler patches.

For screw thread joints, especially on defective threads.

Coating flanged joint faces.

For repairing leaks in screw thread and flange joints.

For use between boiler and cylinder saddles.

For making the extension smoke box joint on locomotives.

For repairing leaky mud rings.

For repairing leaks in boiler legs.

For making joints on sectional, cast-iron tank work.

It is used by steamship engineers, steamboat engineers, ship builders, and by the U. S. Navy in place of white and red lead and iron borings.

For stopping leaks and repairing tin or iron roofs.

For coating corrugated metal gaskets.

GENERAL DIRECTIONS FOR MIXING.

SMOOTH-ON Elastic Cement must be stirred to an even consistency before being removed from the can. It may then be applied to hot or cold metal, as a paint or paste. Warming this cement before application hastens its hardening. It may be thinned with kerosene or linseed oil.

To Apply as a Slow Hardening Putty, which may be applied to hot or cold metal: Stiffen SMOOTH-ON Elastic Cement to any desired consistency by adding to it SMOOTH-ON Iron Cement No. 1 **in Powder Form**. This combination hardens slowly, about like red lead putty. Its hardening may be increased by heat. (The above method is generally used because there is no hurrying of the work to get through before the cement gets too stiff or hard to handle and thus prevents waste of material). **To make an extra stiff putty** the SMOOTH-ON Elastic Cement should be heated before the SMOOTH-ON Iron Cement No. 1 or No. 2 powder is added to it.

To apply as a Very Quick Hardening Putty, which may be applied to cold metal or to metal not exceeding 100° Fahrenheit: Mix the SMOOTH-ON Iron Cement No. 1 or No. 2 with water before adding it to the SMOOTH-ON Elastic Cement as follows: Measure out the desired quantity of SMOOTH-ON Iron Cement and mix with water to the consistency of stiff putty, when thoroughly mixed add to it $\frac{1}{4}$ bulk proportion of SMOOTH-ON Elastic Cement and thoroughly work it into the SMOOTH-ON Iron Cement; it will mix readily and make a putty-like compound, easily applied. If it begins to harden too quickly add a few drops of water. The above method is for hardening SMOOTH-ON Elastic Cement quickly.

All rust and foreign matter must be removed from all surfaces and the surfaces thoroughly dried before applying SMOOTH-ON Elastic Cement. A clean rough surface is much better for SMOOTH-ON than a clean smooth surface.

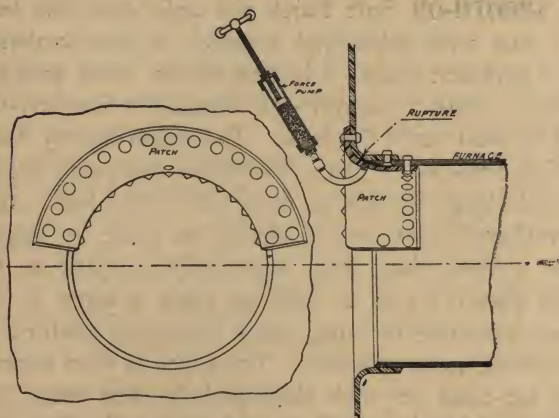
SOFT PATCH.



A **SMOOTH-ON** Soft Patch not only stops the leak, but adds additional strength to the weakened part and makes a lasting repair, when properly applied. With a **SMOOTH-ON** Patch, the **SMOOTH-ON** Iron Cement stops the leak. The patch merely holds the **SMOOTH-ON** in place; therefore, the patch should be made large enough to cover all of the leak, crack or weakened part, and it should be made by lipping down a steel plate (not necessarily as thick as the boiler plate), so as to hold in place a layer of the mixed **SMOOTH-ON** putty when shaped to conform to the surface to be repaired. The patch is then secured with tap-bolts or with through-bolts and nuts; the bolts should be as small as the patch will allow, and they should be placed as near together and as near the outer edge of the patch as the strength of the metal will permit. Wherever possible, put a row of bolts down the center of the patch. In such cases tighten all the outer edge bolts first, then when you tighten the inner bolts, the springing in of the patch will force the **SMOOTH-ON** into the leak and stop it.

FOR SOFT PATCHING, use a compound composed of one part of **SMOOTH-ON** Elastic Cement and one part of **SMOOTH-ON** Iron Cement No. 1 or No. 2, by volume. This, when thoroughly worked, will combine to make a stiff putty, easy to work and apply. The boiler can be used as soon as the application of the **SMOOTH-ON** Boiler Patch is completed.

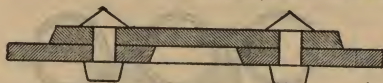
BOILER PATCH REPAIR.



THIS Cut shows a marine boiler hard patch and a putty pump for forcing SMOOTH-ON Elastic Cement under it after it is riveted to the boiler plate. Boiler patches that have become leaky can be repaired by this method. Work is done in less than one-quarter of the time required by the old method, making better and neater work. The pump is made out of a piece of 2-inch brass pipe fitted on a plunger which is forced down by means of a screw. To the lower end of pump is attached a half-inch pipe which is fitted to holes tapped in the patch, giving access to the space to be filled with SMOOTH-ON Elastic Cement. The Pump is recharged by unscrewing cap.

This cut illustrates method of Boiler Patch Repair on one of the U. S. Transport Ships.

FOR HARD PATCHES AND LOCOMOTIVE PATCHES.



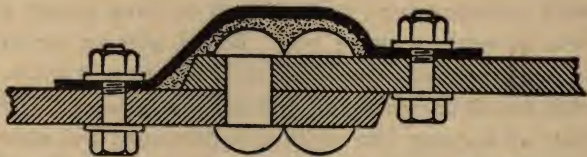
Hard Patch.



Locomotive Patch.

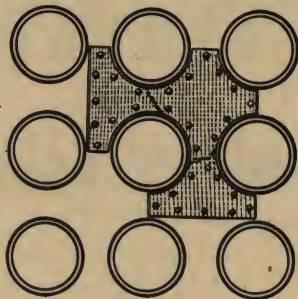
Paint SMOOTH-ON Elastic Cement on the surfaces to be united. It fills up any uneven places, metallizes and makes the patch tight without caulking the edges.

REPAIRING LEAKS AROUND RIVETS.



IN some cases instead of replacing leaky rivets, it may be advantageous to put the patch over the seam, rivets and all. In such cases a SMOOTH-ON patch may be applied as illustrated above. The patch is made of metal not more than $\frac{3}{16}$ or $\frac{1}{4}$ of an inch thick. It is flanged and made with a recess of suitable size and form to accommodate the rivet points. The patch is then filled with a compound composed of one part of SMOOTH-ON Elastic Cement and one part of SMOOTH-ON Iron Cement No. 1 or No. 2, by volume, thoroughly worked together to a stiff putty. The patch with its contents is then secured by bolts to the boiler, as shown.

REPAIRING A CRACKED TUBE SHEET.



A CRACK in a tube sheet usually extends from tube to tube—such a crack may be covered by a patch as shown above, extending over the crack and covering enough good metal to obtain a secure hold. Before applying the patch, SMOOTH-ON Elastic Cement should be applied to it and to the crack and all uneven places, as it produces a smooth surface, closes all openings into which it is introduced and makes a permanent repair when properly applied. General directions for applying a patch are shown on page 49.

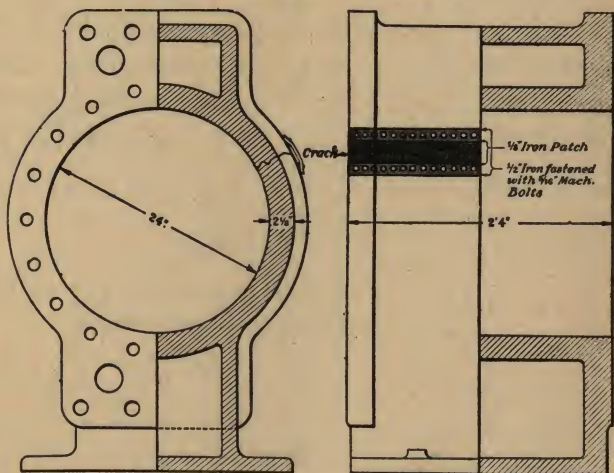
Rockford, Ill., Nov. 15, 1909.

Smooth-On Mfg. Co.

Gentlemen:—A few months ago a small crack opened up in the cast iron header of one of our water tube boilers. The crack, though small and not dangerous, was a nuisance. As the boiler could not be shut down and a new header put in at that time very handy, we decided to try SMOOTH-ON. The crack was accordingly cleaned out and a small quantity of SMOOTH-ON tamped into the crack. This was allowed to dry and some more plastered on the outside and back. It held perfectly and didn't leak a drop up to the time a new header was put in several months later. We have used SMOOTH-ON in several other places around the plant and can cheerfully recommend it.

F. E. GOLDEN, 405 Hill St.,
Engineer Rockford Elec. Co.

Smooth-On Double Patch Repairs a Cracked Cylinder.



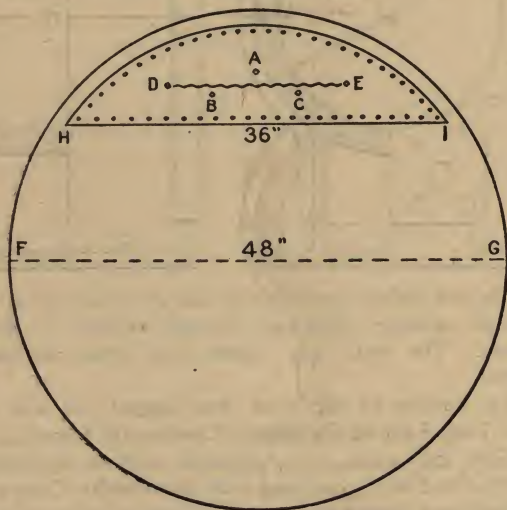
The cut shows the end and side elevations of a cracked hydraulic cylinder. One-half of each elevation is shown in sections. The crack was visible only when pressure was applied.

The outside of the crack was chipped out with a cape chisel. Then SMOOTH-ON Elastic Cement was forced in. When this first application had hardened, another application of SMOOTH-ON Elastic combined with SMOOTH-ON Cement No. 1 was made and forced into the crack, until the crack was completely filled. Then a patch made of $\frac{1}{8}$ in. iron was fastened over the crack with screw bolts—this held the cement securely in the crack.

Then a patch of half-inch boiler iron was applied. This strengthened the cylinder which had cracked all the way through. Both patches were slightly dished and filled with SMOOTH-ON Elastic Cement. The above method made the cylinder tight and strong.

Cracked Cylinder Repaired.

A cross compound high pressure cylinder at the 66th Street power house of the Edison Electric Light and Power Company, was repaired with SMOOTH-ON Elastic Cement and SMOOTH-ON Iron Cement No. 1—description on opposite page.



Diameter of Cylinder.....	48 inches. F to G.
Length of Crack	16 inches, D to E.
Length of Patch	36 inches, H to I.
Boiler Pressure	150 lbs.
Boiler Patch	$\frac{1}{2}$ inch steel plate.
Bolts	$\frac{5}{8}$ inch on edge of patch.
Bolts	$\frac{3}{4}$ inch in the center of patch.

Cracked Cylinder Repaired.

THE REPAIR WAS MADE AS FOLLOWS:

1. While the cylinder was hot a partial vacuum was created in it and SMOOTH-ON Elastic Cement was painted over the crack. The vacuum drew the cement in and this operation was continued until the crack would take up no more cement.

2. Holes were then drilled and tapped at the end of the crack, D and E, and bolts put in to prevent a further extension of the crack.

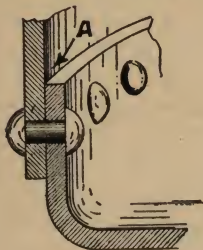
3. The patch was cut as represented.

4. The crack was then painted with SMOOTH-ON and the patch laid in position. Then it was carefully removed. The imprint of the crack was now shown on the under side of the patch—the SMOOTH-ON sticking to it. The patch was then dished along the line of the imprint to make a recess to hold sufficient cement.

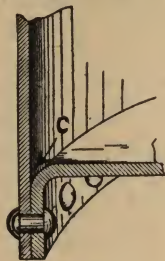
5. The plate was then warmed and a compound, composed of SMOOTH-ON Iron Cement No. 1 and SMOOTH-ON Elastic Cement, mixed half and half, applied to the warm plate with a small trowel, making a thin, even coating.

6. Then the patch was laid in position. The three centre bolts, A, B and C, nearest the crack were brought up (just taut). Then the outside bolts were brought up tight, and lastly, the three centre bolts were brought up as tight as possible, which forced the cement into the crack. The steam was turned on and the crack was tight.

REPAIRING LEAKY SEAMS.



No. 1.



No. 2.

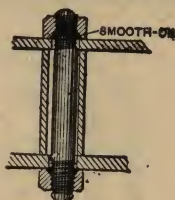
CUTS showing two places in boilers where SMOOTH-ON is successfully used for stopping leaks after caulking proves unsuccessful.

SMOOTH-ON Elastic Cement was used for work illustrated by cut No. 1; the cement was applied with a stiff brush to the seam A its entire length, then the working pressure of the boiler was turned on, which forced the cement well into the seams and stopped all leaking.

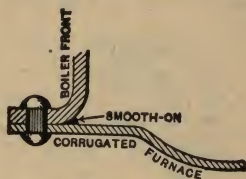
SMOOTH-ON Iron Cement No. 1 was used for work illustrated by Cut No. 2. The cement was made to a stiff putty by mixing with water and a layer applied to the seam C, its entire length, with a trowel, so as to make a fillet around the inside of the joint between the head and shell. allowed to stand 12 hours to metallize, and made the seam perfectly tight.

For boiler or tank seam leaks, and leaks around rivets, if possible apply SMOOTH-ON Elastic Cement to the inside with a brush or trowel and when the pressure is turned on it will force the cement into the seams where it will metallize and stop all leaks. By forcing or drawing the cement into the seams it may be successfully applied from the outside.

STAY BOLT AND FILLET CEMENT.



Cut No. 1.



Cut No. 2.

SMOOTH-ON Elastic Cement mixed with SMOOTH-ON Iron Cement No. 1 to the consistency of a stiff putty makes a compound unequalled for use under the nuts of screw stay bolts and main stay braces.

Cut No. 1 shows a stay bolt nut, with receptacle for this compound.

Cut No. 2 shows corrugated furnace and boiler front joint, made tight with SMOOTH-ON Elastic Cement and SMOOTH-ON Iron Cement No. 1, mixed half and half, by volume. This compound is now used by large boiler makers for making this joint on new work because it keeps it tight.

ST. CATHERINE-RUDISIL GOLD MINES COMPANY.

MARKET AND FULTON BANK BUILDING,
NEW YORK CITY.

CHARLOTTE, N. C., April 16, 1905.

SMOOTH-ON MFG. CO.

Gentlemen:—Please send us price on 10 lb. cans of SMOOTH-ON, as we had an engineer use some on leaks in steam line in our shaft and it proved very satisfactory.

Yours truly,

T. T. TOMPKINS.



Fig. 1
The Leak

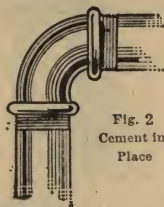


Fig. 2
Cement in
Place

Fig. 3 — Tamping Cement in Leak
with Caulking Tool

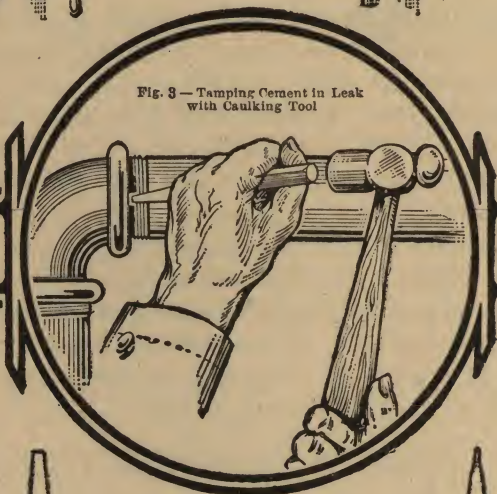


Fig. 4
SMOOTH-ON Caulking Tool
For Repairing Crack and Screw Thread Leaks



Front
View



Side
View

To Stop Leaks in Screw-Thread Pipe Joints.

CLOSE THE VALVES on each side of the leak while full pressure is on the pipe and as soon as the steam stops blowing out of the leak and while the pipe is hot, paint Smooth-On Iron Cement No. 3 over the leak at least 3 inches on each side of the leak (Fig. 2), repeating this three times at intervals of fifteen minutes. Partial vacuum in the pipe caused by the condensation of the steam will draw the applied cement into the leak. Caulk the applied Smooth-On Cement at each application, starting with the cement furthest away from the leak and caulking toward it (Fig. 3). When the leak is reached, the caulking tool will sometimes enter the leak a half inch or more, and in such cases mix some Smooth-On Iron Cement No. 1 with water to the consistency of a stiff putty, then add to it about one-quarter in bulk of Smooth-On Elastic Cement No. 3. Work this mixture thoroughly to the consistency of a stiff putty and fill the leak by carefully tamping the cement in with the caulking tool. Do not apply too much cement at a time, but keep at it until the leak is filled; and, if properly applied, it will stop the leak and make a permanent repair.

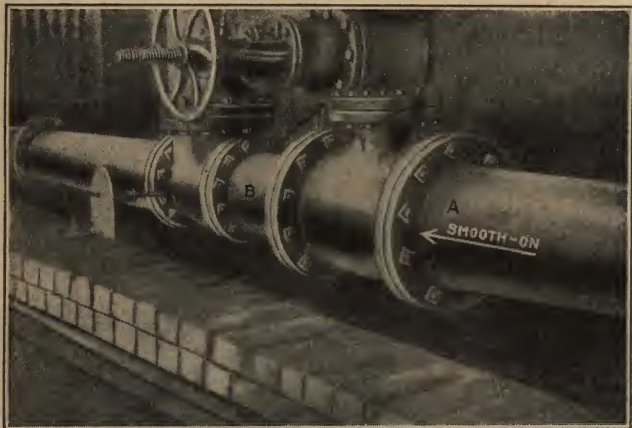
The valves must be kept tight during the operation, so as to hold the partial vacuum.

The caulking tool used for this repair should be made from $\frac{1}{2}$ -inch steel 10 inches long and drawn to a flat point 3-16 inch wide and 1-16 inch thick at the end. For pipes below 6 inches in diameter make the caulking tool 10 inches long and draw to a flat taper 3-16 inch wide and 1-32 inch thick at the end. **Do not draw to a sharp point**, as then the caulking tool will not force the cement into the leak, but will simply drive through it.

The above method of applying Smooth-On Cement to screw-thread leaks has been successfully used in places where the steam could not be shut off.

The above method may also be applied to repairing cracks, tanks, boilers, etc.

SCREW THREAD LEAKS STOPPED.



MIDDLETOWN, OHIO, APRIL 13, 1909.

I enclose photo of a section of a 12 inch steam line in our plant. The joint marked "A" leaked badly in four or five places where the pipe was screwed into the flange. Caulking was useless, so concluded to renew a section about seven feet long. As this would necessitate removing the eight inch nipple "B," we concluded to give SMOOTH-ON Iron Cement a trial.

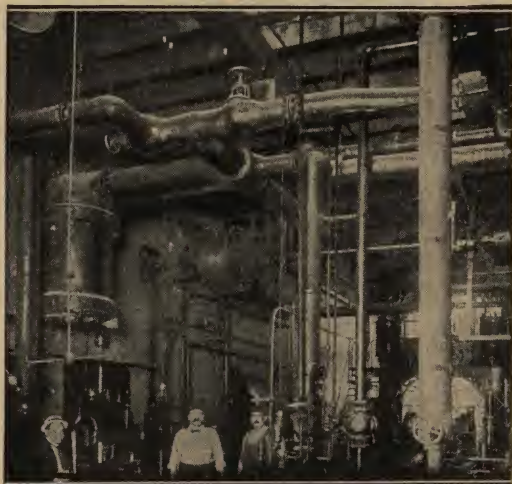
We stiffened SMOOTH-ON Elastic Cement by adding SMOOTH-ON Iron Cement No. 1 to it and thoroughly working this mixture to the consistency of stiff putty, then we caulked it into the leaks. This was allowed to metallize; then steam was turned on without a sign of a leak. The joint is still perfectly tight, a steam pressure of 110 pounds.

This saved \$15.00 on the pipe alone; the cost for the cement was about 15 cents.

Very truly yours,

S. A. FRASER,
Care American Rolling Mill Co

SCREW-THREAD LEAKS STOPPED.



THE FRANK BREWERY

Borough of Queens, N. Y.,

July 2, 1912.

SMOOTH-ON MFG. CO., Jersey City, N. J.

Gentlemen: In December, 1911, your representative, Mr. C. E. Googins, called on our Chief Engineer and explained the different uses of Smooth-On Iron Cement. I showed him a bad steam leak in our main line in the thread where a 12-in. pipe went into a cross "T." To take this pipe down meant a large expense; also it being winter, we would probably get some expensive freeze-ups.

This "T" has been caulked with copper, also other metals, several times, but it would soon commence to leak again; I arranged with your Mr. Googins to have steam off the line the following Sunday and arranged for him to be with the Engineer while doing the job.

When he came it was so cold we could not shut down; we had to run an engine to heat part of the building by exhaust steam. Mr. Googins said drop the pressure to 40 pounds and he would do the job. He first took Smooth-On Elastic Cement No. 3, painted it on the thread a space of 4 inches, then commenced caulking up towards the leak; in a few minutes it stopped. Then he mixed Smooth-On Iron Cement No. 1 and No. 3 to a thick putty and filled the recess made by the caulking tool with the iron putty.

Pleased to say it has never leaked since.

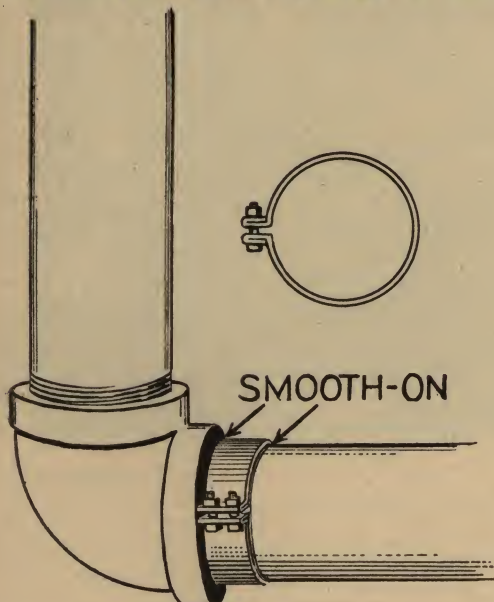
The next day my Engineer did a job on an 8-in. "L" with 90 pounds pressure, with steam blowing out when he started on the job, and that has never leaked. The Engineer states he surprised himself.

Yours truly,

HENRY KOHL,
Chief Engineer.

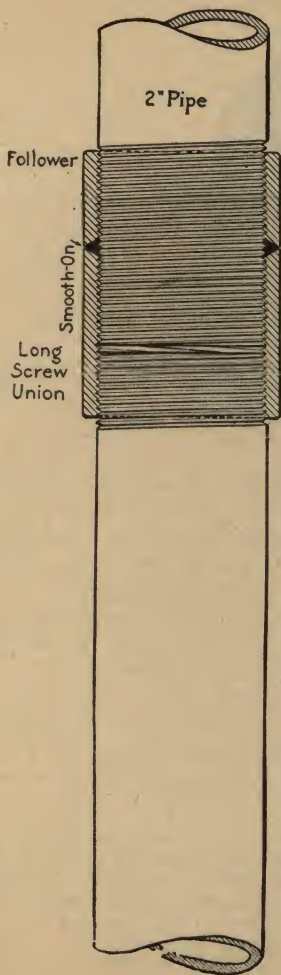
THE FRANK BREWERY,
Philip Geyer, Vice-Pres. and Supt.

SCREW THREAD LEAKS STOPPED WITH SMOOTH-ON UNDER A BAND.



Shape a $\frac{1}{8}$ -inch piece of strap iron the exact size of the pipe and coat it on the inside $\frac{1}{8}$ -inch thick with SMOOTH-ON Iron Cements No. 1 and No. 3 mixed as per directions found on the lower half of page 48, excepting use $\frac{1}{2}$ bulk proportions of No. 1 and No. 3, then spring the band on the pipe, insert bolts, place the bolt side quarter way round from the leak, as near the fitting as possible and tighten up keeping the outside bolt a little tighter until the band is nearly as tight as possible, then drive the band toward the fitting and continue tightening both bolts, as much as possible. The expansion of the SMOOTH-ON will stop the leak and hold the band in place.

SCREW UNION JOINT.

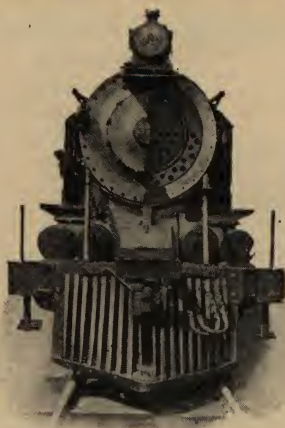


A striking illustration of the adaptability of SMOOTH-ON in a power plant.

The sketch shows a socket and follower on a pipe made absolutely tight by the use of SMOOTH-ON. The pipe was one-forming a water arch in a boiler furnace. One of the pipes started leaking and it was cut out and a new piece substituted, making its connection, with a long screw union, and follower, which were concaved to form a recess for packing.

When the job was finished it was found that the joint would leak, although it could be made to hold for about a month by the use of asbestos wick. The joint was, however, made permanently tight as follows: ordinary lamp wick was soaked in SMOOTH-ON Elastic Cement (a paste), then rolled in SMOOTH-ON Iron Cement No. 1 (a powder). The paste thoroughly moistened the wick, causing the powder to stick; then the pipe at the recess between the socket and follower was wound with enough of this wick to completely fill the recess when the joint was made tight. The screw threads were also treated with SMOOTH-ON Elastic Cement.

FOR LOCOMOTIVE JOINTS.

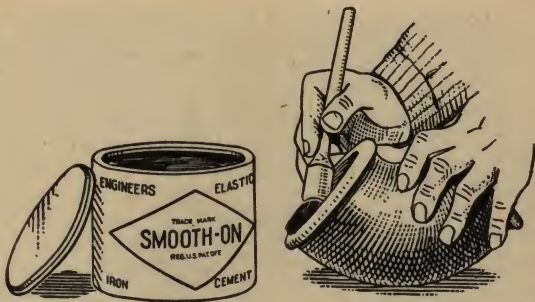


SMOOTH-ON Elastic Cement and SMOOTH-ON Iron Cement No. 1 mixed half and half, by volume, to the consistency of stiff putty is unequalled for making locomotive boiler joints. This combination is easy to work and manipulate. There is no hurrying of the work to get through before the cement gets too stiff or hard to work, because it stays soft and pliable until heated, and this does away with all waste of material. All the cement left over may be returned to the can for future use. All work done with this cement, such as boiler patching, painting inside seams, etc., may be tested at once. It may be applied as a paint, paste or putty.

Large railroad shops are now using the above combination:

- For joints between boiler and cylinder saddles.
- For joints between boiler and smokestack saddles.
- For joints around the extension smokebox front.
- For stopping leaks and corrosion in boiler legs.
- For use under boiler patches. (Soft and hard.)
- For making permanent screw thread joints.
- For stopping leaks and corrosion in tender tanks.

SCREW THREAD JOINTS.



SMOOTH-ON Elastic Cement is used for making permanent screw thread joints. A screw thread joint once made with this material will not leak. It is especially valuable on large screw thread joints for high pressures.

SMOOTH-ON Elastic Cement is applied to the screw threads the same as red and white lead. The advantage of SMOOTH-ON is that it expands in hardening and so closes up any defective places, which would cause leaks if any other cement was used. It is especially useful for ammonia joints.

DOMESTIC ICE MACHINE Co.,

Manufacturers of Automatic Ice and Refrigerating Machinery
21-23 West 34th St., New York, U. S. A.

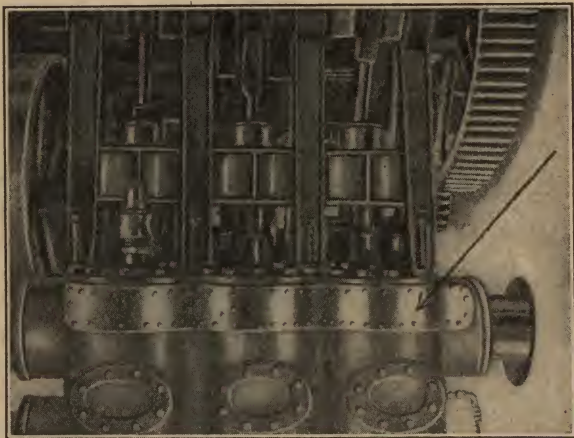
Gentlemen:—Please send us 50 lbs. of SMOOTH-ON Elastic Compound. We are now using it exclusively in the erection of our ice and refrigerating machinery, in the place of litharge and glycerine, and we have yet to have the first leak in our joints, where we have used this Compound.

Very truly yours,

DOMESTIC ICE MACHINERY CO.

John D. Scott.

TRIPLEX POWER PUMP REPAIR.



SUPERINTENDENT OF POWER,
TENNESSEE COPPER CO.

COPPERHILL, TENN., Sept. 23, 1909.

SMOOTH-ON MFG. CO.

Jersey City, N. J.

Gentlemen:—In reply to yours of August 4, I am enclosing you photo of repair we have accomplished by the use of SMOOTH-ON Cement.

This is a Triplex Geared Power Pump, 15 ft. x 12 ft., which was cracked through all valve chambers, through valve decks, and one partition between plunger cylinders. This was repaired, so as to operate without leakage, by applying SMOOTH-ON Cement to cracks previously dovetailed out, and cracks held together with bolts passing through valve chamber covers, through valve decks, into good solid iron, by patch shown externally on front of pump.

We find SMOOTH-ON to be very useful in many minor ways about the plant, and use it wherever it may be indicated.

Very truly yours,

G. L. FALES,

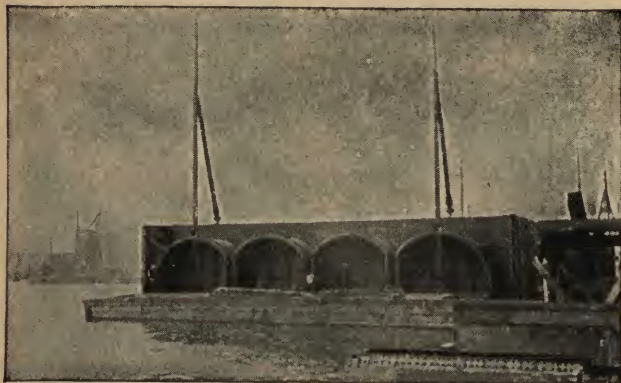
Ch. Engr. Tenn. Copper Co.

WATER-TIGHT WASHER JOINTS.



The above picture shows where Smooth-On Elastic Cement No. 3 is used in subway tunnel construction work, where it is necessary to have absolutely water-tight joints. Smooth-On Elastic Cement is painted on both sides of the washers, which are then used under the head and nut of each bolt. When the nuts are drawn up the Smooth-On Elastic Cement No. 3 makes the joint perfectly water-tight.

WATER-TIGHT STAY BOLT JOINTS.



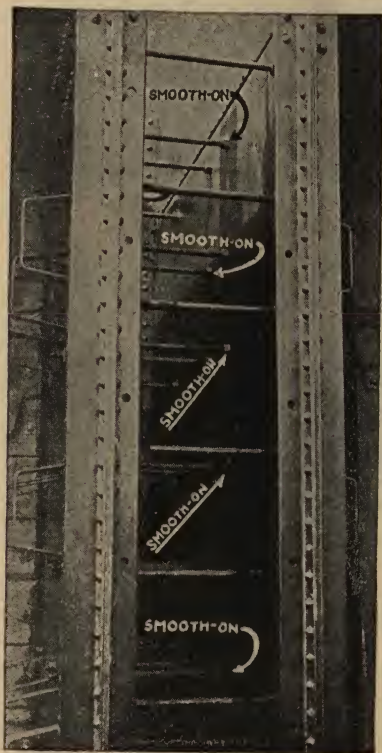
Tunnel Sections Ready for Sinking.

All stay bolt joints on the tunnel work shown are made with **Smooth-On Elastic Cement No. 3**. The stay bolts are shown between the sections.



Tunnel Sections Under Construction.

WATER-TIGHT STAY BOLT JOINTS



This picture shows a close view of the stay bolt work shown on the opposite page.

Smooth-On Elastic Cement No. 3

was applied with a brush to the screw-threads of the stay-bolt nuts, and also to the faces of the stay-bolt nuts on both sides of the sheets. They were then drawn tight, making a water-tight joint. The completed sections are lowered to the

bottom of the river and must be water-tight.

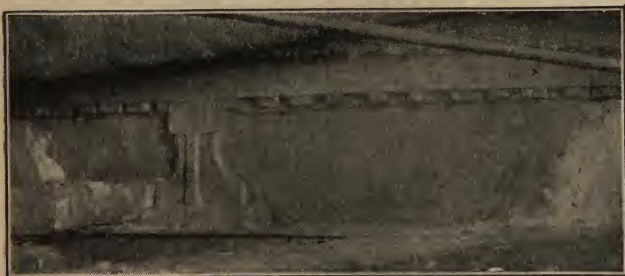
Contractors—Arthur McMullen & Hoff Co., New York, N. Y.

OLAF HOFF,
Engineer.

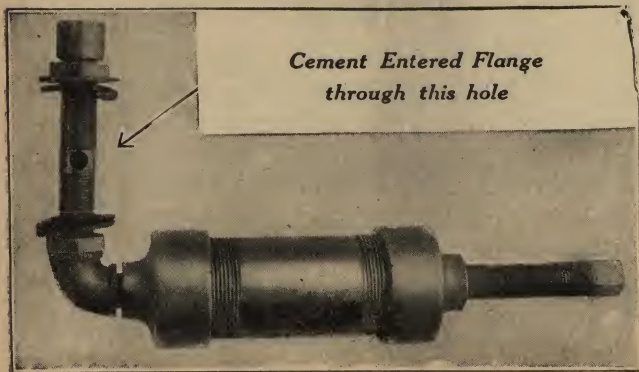
18 Feet Diameter Flanged Joint Made Tight.



Leaky Flange with Pump in Position.



After repair had been made.



*Cement Entered Flange
through this hole*

Pump used to Inject Smooth-On Cement.

18 FEET DIAMETER FLANGED JOINT MADE TIGHT.

April 10, 1913.

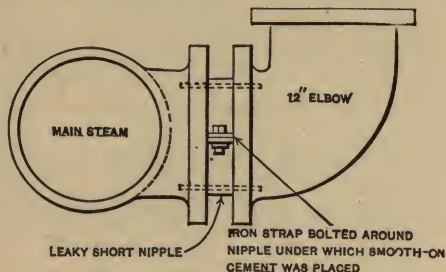
The photographs on the last page explain how a Flanged Joint on a Copper Brew Kettle, size 20 feet high and 18 feet diameter, was repaired with Smooth-On Elastic Cement No. 3.

The repair was made, first by taking out one at a time the bolts nearest the leaks and inserting into the bolt hole a screw force pump. The mixture used in this pump was Smooth-On Elastic Cement No. 3. This pump forced the Smooth-On No. 3 into the leaks around the flange bolt holes. When all the Smooth-On had been pumped through one bolt hole that was possible, the pump was removed, the bolt replaced, then the next bolt nearest the leak was removed and the screw pump inserted into it and the same method of forcing the Smooth-On Elastic Cement No. 3 into the leak was repeated. This was continued until all the leaks were stopped. Steam was turned off while the pump was being taken out and the bolts replaced. The job was done with a steam pressure on for two reasons: first to have the steam pressure against the Smooth-On Cement, so the screw pump would not force the cement through the flange. Second, to have the heat from the steam drive out the volatile matter and harden the cement quickly.

The kettle was allowed to remain out of commission for four days with a little steam turned on. The photograph shows the steam kettle in use with its usual working steam pressure.

To take this kettle apart and put in a new flange would have cost \$500.

LEAKING SHORT NIPPLE REPAIRED.



The above cut illustrates how a leaking short nipple was successfully repaired with SMOOTH-ON Elastic Cement. The engineer wrote as follows:

“A short time ago I installed a line of 12 inch steam pipe and when steam was turned on we found a short nipple leaking badly. To take down this line would mean a great expense, so we fitted a steel band and thoroughly coated the nipple with SMOOTH-ON Elastic Cement, then applied the band, drawing it together as shown in the cut, making the joints steam-tight. This pipe is in use and has never given trouble since.”

Office of Chief Engineer,
THE BOSTON CITY HOSPITAL,

Boston, August 1st, 1905.

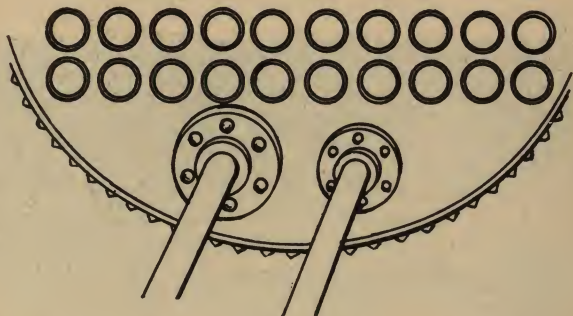
SMOOTH-ON MFG. Co.,
Jersey City, N. J.

Gentlemen:—I have been using your SMOOTH-ON Cement for over a year with pleasure to myself and profit to my employers. Will you kindly send me your book on the application of your SMOOTH-ON.

Respectfully,

J. C. LONG, *Chief Engineer.*

FLANGED JOINT REPAIRED.



MR. YOUNG, engineer of the Sperry & Beale Co., of Brooklyn, was putting a new flange on a blow-off pipe, but it seems that rust had so eaten into the boiler where the old flange had been connected that he had to use a large size flange so as to get the holes in a different place.

By using SMOOTH-ON Elastic Cement on the damaged part he was able to get a perfect seat. This was four years ago, and it is still giving perfect satisfaction.

 ERIE RAILROAD COMPANY.

SMOOTH-ON MFG. Co., Jersey City, N. J.

Gentlemen:—The SMOOTH-ON received, and it is all right. I have used it in several places and it has helped me out.

E. DU BOIS, C.E.,
Pavonia Ferry, Jersey City, N. J.

 LANCASTER, OXFORD & SOUTHERN R.R. COMPANY,

OFFICE OF THE SUPERINTENDENT,
OXFORD, PA.

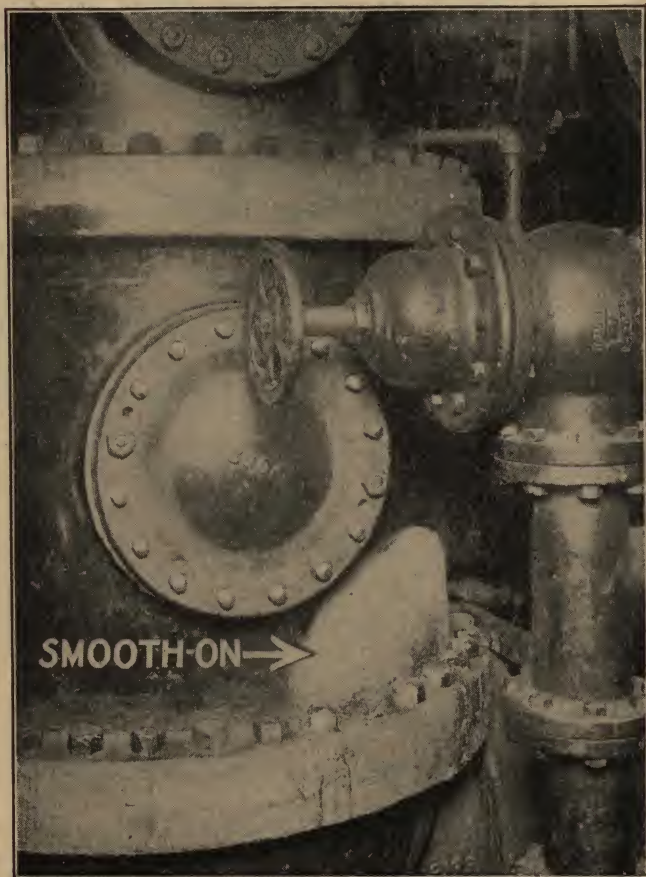
SMOOTH-ON MFG. Co., Jersey City, N. J.

Dear Sirs:—Please ship us at once 15 lbs. SMOOTH-ON. Our people are well pleased with it.

June 22, 1901.

A. M. NEVIN, G. M.

POROUS CASTING REPAIRED.



Repair explained on next page.

OFFICE OF THE SUPERINTENDENT.

The Belnord, 86th St. and Broadway, New York, N. Y.

February 15, 1913.

SMOOTH-ON MFG. CO., Jersey City.

Gentlemen: The work on the elevator pump in this plant has been to my mind a complete success. This pump is at present working under 200 lb. head pressure on elevator service and there is no sign of any further leakage.

The section of this pump that was giving me trouble was the lower water chamber, the casting of which after three years' running proved to be porous. The pores in the casting could hardly be discerned on the inside with the naked eye.

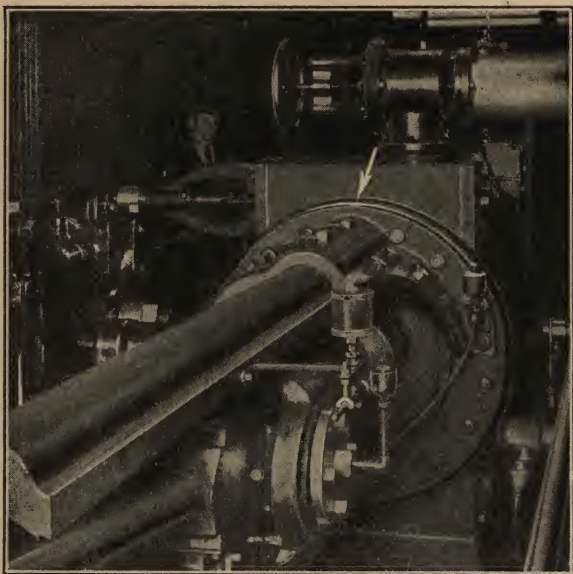
The method of making the repairs on this pump suggested by your Engineer was as follows: The surface of the casting was thoroughly cleaned and a steam connection made in this casting, 125 lbs. steam pressure being supplied for 2 hours. Then shut off, all openings kept closed, the steam in the casting allowed to cool, thereby causing a vacuum to be created inside the chamber giving us the desired effect, that of drawing all foreign matter out of these small pores or holes. This method was repeated three times before we decided to apply Elastic Smooth-On Cement which was applied from the inside and put under steam pressure of 50 lbs. for 1 hour to force the Elastic Cement into all the small openings in this casting. Three applications gave us the desired effect. The last application was thickened up with No. 1 to a stiff putty to fill the large holes, then Elastic Cement painted over it and 150 lbs. steam pressure turned on for 4 hours.

I sincerely thank the Smooth-On Company for the services and advice of your Engineer, for without his assistance and advice on this job I fear I would have had but poor success.

Yours truly,

WM. W. DOWNEY, Engr.

GASKET JOINT MADE TIGHT.



Brooklyn, N. Y., Oct. 25th, 1910.

Gentlemen:

I have under my charge at the works No. 101 Classon Ave.; Brooklyn, a 28x60 Corliss Engine. This engine is about fifty years old, about a year ago the Gasket on the crank end Cylinder Head commenced to leak causing me considerable trouble and annoyance.

To put in a new Gasket meant a shut down of 4 or 5 days and as they were busy in the mill, deriving power from this Engine, I was in a quandary. Your Engineer Mr. Googins happened along one day and advised using Elastic Smooth-On Cement. I was rather dubious about using the Cement but however ordered a 5 pound can and made a small pump to force the Cement into the joint. That Saturday afternoon after shutting down I drilled a $\frac{5}{8}$ inch hole in the top of the Girder frame where it is recessed out to receive the Cylinder head, and started to force the Cement into the hole I had drilled by using a piece of $\frac{5}{8}$ inch round iron and tapping it gently with a hammer; with this method I forced in about 4 pounds of the Cement. I then let it harden until Monday morning. On starting up that morning I found everything absolutely tight and it has been so ever since.

The product you manufacture is a grand thing for Engineers as it saves time, trouble and expense and I would not be without it.

Yours very truly,

H. Cassidy, Chief Engineer,
Waterbury Company,
No. 101 Classon Ave., Brooklyn, N. Y.

FLANGED JOINT REPAIRED.



SMOOTH-ON MFG. Co.

Eastern Office, 141 Broadway,
NEW YORK, Aug. 21, 1907.

Gentlemen:—Referring to our promise to let you know how we succeeded with the repairing of the reheating receiver on the 32 inch x 70 inch x 72 inch cross compound engine we installed at the Merchants Mfg. Co., Fall River, Mass., would say the receiver shell was of cast iron, made in two rings or sections. The parties furnishing the copper coils also furnished the packing and completed the receiver ready for installation. After being installed for a short time the packing at center joining the shells gave out, and to repack the joint, owing to the necessity of disconnecting the exhaust pipe and coil, it was estimated would cost \$350. It was therefore decided to try SMOOTH-ON first. The engine was shut down on Saturday noon and the air pump kept running, producing a vacuum in the receiver. Elastic SMOOTH-ON was applied at the joint with a brush, the receiver still being quite hot, and the leak at once stopped; after which a torch was applied, the result being a more permanent job than repacking the joint, and at a comparatively trifling expense. Thanking you for all courtesies extended in this connection, we beg to remain,

Very respectfully yours,

THE BASS FOUNDRY & MACHINE CO.

F. Ruel Baldwin, E. Mgr.

SMOOTH-ON CASTINGS

No. 4.



YELLOW LABEL

Trade Mark Reg. U. S. Pat. Off.

Is an Iron Cement for repairing blemishes, blow-holes or defects in iron or steel castings, made in two grades. For foundrymen. Applied as a putty.



Sold in 1, 5 and 10 Pound Yellow Labeled Tin Cans, like the above. And in 25, 50 and 100 lb. steel kegs as shown opposite.

No. 4.

Smooth-On Castings.

SMOOTH-ON Castings is a chemical iron compound prepared in powdered form and used by mixing with water to the consistency of stiff putty. When in this state it is a chemical plastic iron that will metallize in a few hours and become a part of the casting to which it is applied. When hard it has the same color and appearance as cast iron, which makes it valuable for smoothing over and filling up blowholes in iron or steel castings. One pound of SMOOTH-ON Castings will fill 10 cubic inches.

EVERY FOUNDRY, no matter how well regulated, no matter how high the mechanical skill of its moulders, will have part of its castings go to the scrap-heap.

How often is the expression heard: "I would give five, yes, ten dollars if that spot was not there." The spot may be a small sand hole, or a piece of slag may have entered the mould, but in any event it is an eyesore, which the maker does not enjoy.

True, such a casting is every bit as strong as a perfect casting, but its appearance is what causes it to be doubted.

SMOOTH-ON Castings if applied to such defects will permanently repair them and give the casting a perfect appearance.

IT IS AN OLD SAYING that paint and putty will make any casting look nice, but both of these only temporarily hide the defect.

When the casting is used, the paint wears away, and the putty falls out.



Before Using
SMOOTH-ON Castings.



After Using
SMOOTH-ON Castings.

THE MODERN FOUNDRY is called upon to furnish a large number of castings, which are subject to a continual pressure. Although a casting may have a smooth skin and be without a visible blemish of any kind, it is well known that no one ever knows what a casting amounts to until it is tested.

The iron boils a little around a core, a bit of scum is made. and when the casting is put under pressure

it sweats, and shows small leaks, which under ordinary conditions would remain unnoticed.

A great deal of machine work may have been expended on the casting, but if it leaks, out it goes. It is here that SMOOTH-ON Iron Cement No. 1, No. 2, or SMOOTH-ON Elastic Cement prove themselves money-savers.

To see the way they stop a leaky casting, is a revelation to any foundryman who has been in the habit of carting every leaky casting out in his back yard to be melted over again.

And what we want to impress upon your mind is that the repair is permanent. *The "unpleasant" affair is ended* right then and there.

How and when to use SMOOTH-ON Iron Cement No. 1, No. 2, and SMOOTH-ON Elastic Cement is found on pages 8 to 77.

General Directions for Mixing and Applying SMOOTH-ON CASTINGS.

Take the desired amount of compound, mix with it water in bulk proportions of one of water to six of compound, which when thoroughly worked or mixed will become a stiff putty. In mixing the cement measure out sufficient dry cement to do the work and add the water to it. At first the compound repels the water, and the first impulse of the inexperienced user is to add more water. Keep stirring the compound

as measured 6 to 1 and it will soon become adhesive. If a different consistency is desired, add more water or compound as the conditions may require. It is good to work the cement in the hands as you would putty. Apply to the defect, pressing it in hard, smooth over the surface with a knife and allow to harden.

CAUTION:—Do not use too much water in mixing, or the result will not be satisfactory.

To Withstand Rain, Water, etc.

Mix SMOOTH-ON Castings with water 6 to 1 as per general directions, when thoroughly mixed add to it $\frac{1}{5}$ bulk proportion of SMOOTH-ON Elastic Cement and thoroughly work it into the SMOOTH-ON Castings; it will mix readily and make a putty-like compound easy to apply; if it begins to harden too quickly add a few drops of water.

The above mixture of SMOOTH-ON cements is valuable for smoothing over large surfaces.

Special Features.

1. Age does not impair it.
2. It is applied in a putty state.
3. When hard it can be filed, like iron.
4. When metallized it expands and contracts the same as iron.
5. Its color when hard is that of cast-iron.
6. It takes from one to twenty-four hours to harden, depending upon the size of the defect.

Uses for SMOOTH-ON CASTINGS.

1. Smoothing the surface of iron castings.
2. Stopping up sand-holes.
3. Stopping up pores in spongy iron.
4. Covering up countersunk bolts.
5. Smoothing over "cold short" castings.
6. Stopping leaks of gasoline or oil.

Special Instructions.

To repair a sand-hole, crack or spongy spot in the iron, mix the compound as directed, spread it over the defect and tap with a hammer, forcing the compound into the defect, then smooth even with the surface of the casting.

To repair a deep hole add the mixed cement to it in layers. Each layer about 1/4 of an inch thick, allowing one layer to metallize before adding the next.

Where steam or water pressure leaks are to be repaired use SMOOTH-ON Compound No. 1, No. 2, or SMOOTH-ON Elastic Cement according to conditions.

Follow carefully the directions for mixing and applying SMOOTH-ON Castings.

MARSHALLTOWN, IA., Dec. 13, 1901.

DEAR SIRs:—

In reply to yours of the 11th inst., would say that we have used the SMOOTH-ON Castings and find it first class and as represented. It is wonderful the hardness it will obtain, and would be pleased to have you name us a price of SMOOTH-ON from 10 to 20 lbs. at a time, and remain,

Yours truly,

LENNOX MACHINE CO.

SMOOTH-ON JOINTS CAULKING CEMENT

No. 5.



RED LABEL

Trade Mark Reg. U. S. Pat. Off.

Made in two strengths, REGULAR and SPECIAL

Regular for soil pipe and greenhouse pipe joints.

Special for water and gas main joints—for high pressure.



Sold in 1, 5 and 10 Pound tins, like above. And in 25, 50 and 100 lb. steel kegs as shown opposite.

List price, 50 cents per pound F. O. B.

Jersey City,
U. S. A.

SMOOTH-ON JOINTS.

Cheaper and Better Than Lead

SMOOTH-ON JOINTS is a semi-Hydraulic Iron Cement which is used for making joints on cast iron bell and spigot pipes, in place of caulking lead. This cement is made in two strengths, regular strength for soil and greenhouse pipe joints and special strength for heavy, water and gas main joints, for high pressures.

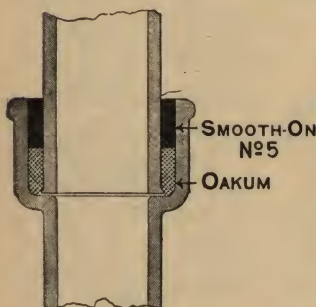
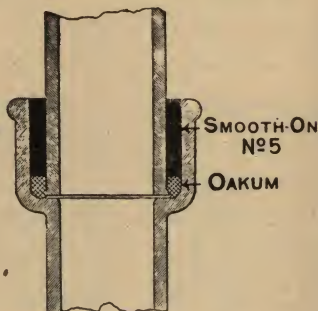
SMOOTH-ON JOINTS is prepared in powdered form, and is applied by mixing with water to the consistency of a very stiff putty; it hardens quickly and expands slightly in hardening, making a tight joint.

SMOOTH-ON JOINTS is very useful for making tight joints in corners, confined spaces, on horizontal lines and on inverted fittings, where it is difficult to caulk with lead.

CAUTION:—When applying SMOOTH-ON JOINTS to soil pipes, follow directions carefully for making soil pipe joints.

Pipe Diameters.	Average Quantity used in Making Joints 1 in. deep.
2 inches.	6 ounces.
3 "	9 "
4 "	12 "
5 "	15 "
6 "	18 "
7 "	21 "
8 "	25 "

One pound of SMOOTH-ON Joints goes as far as five pounds of lead for caulking.

SMOOTH-ON JOINTS.**Cheaper and Better Than Lead****For Soil Pipe Joints****For Greenhouse Joints****DIRECTIONS**

Mix the required quantity of SMOOTH-ON JOINTS with a very small proportion of water, just enough to make a stiff putty. (7 parts of SMOOTH-ON JOINTS to 2 parts of water by volume will make a very stiff putty). Use oakum in the same manner as when using lead, the quantity of oakum as illustrated in the cuts above. Apply the SMOOTH-ON JOINTS in layers, pressing each layer in well with an iron before applying the next, continuing until the joint is full, then smooth over all the way around, leaving the SMOOTH-ON JOINTS as compactly as possible in the joint and even with the top of the hub.

To harden for testing purposes, allow from 3 to 12 hours in a dry place and from 12 to 24 hours in a damp place. A few hours after the joint is made with SMOOTH-ON JOINTS, the hardening of the cement is increased by sprinkling or dampening with water.

SMOOTH-ON JOINTS may be used on tarred pipes.

SMOOTH-ON JOINTS.**Cheaper and Better Than Lead**

JERSEY CITY, N. J., October 28th, 1896.

MR. VREELAND TOMPKINS,

551 Communipaw Avenue, Jersey City, N. J.

Dear Sir:—The two pieces of cast iron pipe you sent, which were put together with your SMOOTH-ON JOINTS Iron Compound, were tested with cold water up to 200 lbs. pressure without a sign of a leak. I then put them on the boiler at a test of 70 lbs. hot water, and they withstood the test all right. I then put them on steam at 70 lbs., with the same result. Expansion and contraction does not affect the cementing in the least.

Yours very truly,

J. N. MATLOCK, M. E.

CITY OF PATERSON, July 7th, 1897.

MR. VREELAND TOMPKINS, Jersey City, N. J.

Dear Sir:—I have used your SMOOTH-ON JOINTS for caulking the cast iron soil pipe and brass ferrules in a three-story dwelling in Paterson, N. J., and submitted it to a thorough test, first by filling the pipes with water, making a gravity test, afterwards the city pressure of 40 pounds was applied; during a test of twenty-four hours no indication of a leak appeared. I consider this material a superior article and recommend its use.

Very truly yours,

WILLIAM A. MACDONALD,

Inspector of Plumbing, Paterson, N. J.

BROOKLYN, N. Y., July 27th, 1897.

MR. VREELAND TOMPKINS, Jersey City, N. J.

Dear Sir:—I have used your SMOOTH-ON JOINTS on the iron sewers and soil pipes of five houses on Barn Bridge Street, this city. We gave them the water test, filling the stacks of 4-inch pipe to the roof, 35 feet high, and found every joint perfectly tight. I consider this compound far superior to lead for caulking purposes.

Yours truly, THOMAS KELLY.

SMOOTH-ON PUTTY CEMENT No. 6.



Trade Mark Reg., U. S. Pat. Off.

WHITE LABEL.

A Plastic putty iron cement, prepared in putty form, ready for use in air tight cans. It is applied with a trowel or putty knife and is very easy to use.

Some uses:

Making water tight joints on structural iron work.

Making water tight joints around chimney flashings on tin, wood or concrete roofs.

For filling seams on wood, iron work or slate work.

For resetting glass in skylights.

For making tight joints between iron work and concrete foundations.

SOLD IN 1, 5 AND 10 POUND CANS.

CONSTRUCTION WORK, N. Y. SUBWAY.

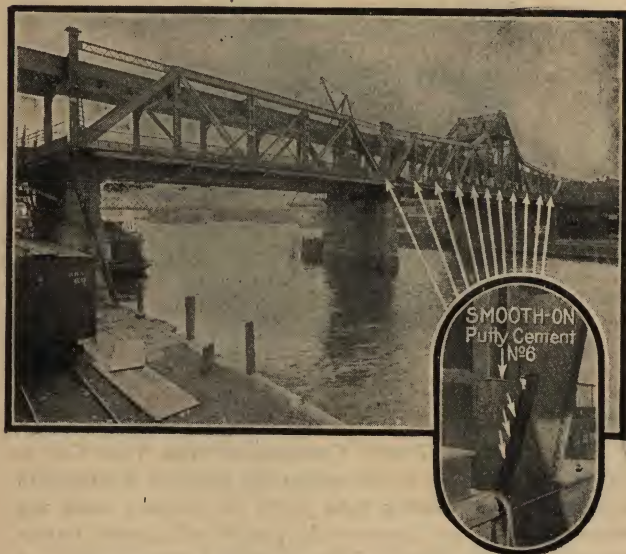


ON July 21st, 1906, we received a request from the Interborough Rapid Transit Company of New York City to make a demonstration to determine the value of SMOOTH-ON Putty Cement for making tight joints on the iron work and between the iron and concrete foundation of subway station entrance at 174th Street. They had been trying putty and other cements with poor success.

What they wanted was a cement that would positively fill all the open joints, cracks, etc., on their station entrances and not shrink or draw away from either side, thus protecting the openings from rust. We advised that SMOOTH-ON Putty Cement would answer the purpose, and applied it on all the open joints of this station.

On September 21st, 1907, they advised us that the SMOOTH-ON applied by us was giving satisfaction. Since that time SMOOTH-ON has been applied to all the station entrances on the subway division of New York City. From the above you will note that SMOOTH-ON Putty Cement is unequalled for making tight joints on iron construction work.

CORROSION PREVENTED.



RAILROAD BRIDGE, NEW YORK CITY.

The steel work on this bridge over the Harlem River, New York City, was recently rebuilt. To prevent snow and rain from lodging between plates where they are close together and to prevent the consequent corrosion, these spaces were filled in with SMOOTH-ON Cement Putty No. 6. This cement makes a water-tight joint and yet permits the free working of the steel members. Where large spaces inside of column bases are filled with concrete, a groove around the top of the concrete next to the steel is left to be filled later with SMOOTH-ON Cement Putty No. 6. The concrete after setting contracts enough to pull away from the steel, permitting the entrance of moisture, with consequent corrosion. This corrosion is prevented by filling this groove as stated above with SMOOTH-ON Cement Putty No. 6.

SMOOTH-ON No. 6 is unequalled for this purpose.

CORROSION PREVENTED.



J. I. HASS, INC.
CONTRACTING PAINTERS AND
DECORATORS
1 Madison Avenue

New York, N. Y., January 28, 1916.

SMOOTH-ON MFG. CO.,

572 Communipaw Avenue, Jersey City, N. J.

Gentlemen:

Regarding the use of SMOOTH-ON Putty Cement No. 6, on the Hudson County Boulevard Bridge over the Pennsylvania Railroad Cut, Jersey City, it was found that water collected between the angle irons riveted together along the bottom of the side railing, which caused severe corrosion of the metal work. Ordinary putty would last in these joints but a short time.

In June, 1915, we painted the openings and then filled them with SMOOTH-ON Putty Cement No. 6, using nearly a thousand pounds. We are pleased to report that the cement has shown no contraction, it completely filled the opening, making a tight joint, which excludes all moisture and has entirely stopped corrosion.

The job has proven very satisfactory.

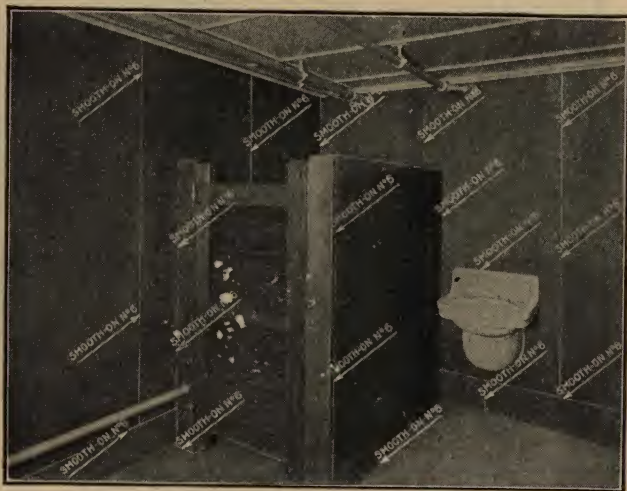
Respectfully yours,

J. I. HASS, INC.,

J. I. Hass, Pres.

JIH-M

WATER TIGHT JOINTS BETWEEN SLATE SLABS.



New Elevated R. R. Toilets, New York City.

The walls of these railway toilets are covered with slate and all joints between the slatework are made with SMOOTH-ON Cement Putty No. 6. This cement expands slightly in metallizing and attaches itself to the slate. This keeps the joints tight and smooth, making an absolutely waterproof, verminproof room, free from cracks, which is easily washed out and kept clean and free from odor.

The SMOOTH-ON Cement Putty No. 6 is the color of slate, which adds to the neat appearance of all slate-work, where this cement is used.

Corrosion of Steel and Decaying of Wood Prevented.

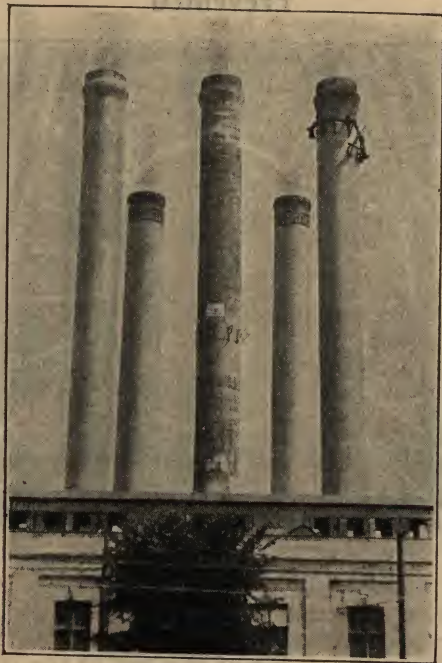


New York Elevated R. R. Steps.

Moisture collecting in the spaces between the ends of the wooden stair treads and the supporting steel beams, caused decaying of the end of the treads and severe corrosion. This disfigured and weakened the center of the steel beam supporting the step at the end of each tread.

To overcome this, a space an eighth of an inch wide is left between the ends of the wooden treads and the sides of the supporting steel beams. This space is filled with SMOOTH-ON Putty Cement No. 6 using enough cement to make a fillet at the surface of the tread. This makes a tight joint between the wood and steel in hot and cold weather preventing any corrosion of the steel or decaying of the wood.

CHIMNEY JOINTS



SMOOTH-ON MFG. CO.,
572 Communipaw Ave., Jersey City, N. J.

July 10, 1920.

Gentlemen:

In reply to your request we herewith enclose photographs showing work in progress and the completed concrete chimneys of the Potomac Electric Power Co. at Washington, D. C.

In connection with the above we are pleased to state that we have used your SMOOTH-ON Cement No. 6 to point up all cracks, open and defective concrete surfaces of said chimneys and find that no other compound, putty or cement equals it for repairing brick or concrete chimneys. We have used your cement repairing brick chimneys for the Warner Sugar Refinery and the City of New York Dept. Water Supply, using same while the chimneys were in operation.

Trusting this information will be interesting to you, we are,

Very truly yours,

ACME CHIMNEY CO.

31 Nassau St., New York City, N. Y.

SMOOTH-ON PUTTY CEMENT, No. 6. FOR VAULT LIGHT WORK.



SMOOTH-ON Putty Cement, like all the SMOOTH-ON Cements, expands in hardening, and when once metalized it will not shrink or draw away from the joint and is not affected by heat, cold, rain, snow or sun.

This makes it extremely valuable for vault light joints and joints between flagstones, concrete work, etc.

It may be used with or without oakum for flagstone joints.

Three years ago the N. Y. & N. J. Telephone Co. had great difficulty in keeping the joint between the vault light frame and the stone flagging tight on one of their vaults. It would leak rain water. Since making the joint with SMOOTH-ON Putty Cement it has been absolutely tight.

SMOOTH-ON PUTTY CEMENT, No. 6. FOR METAL SKYLIGHT WORK.



SMOOTH-ON Putty Cement is unequalled for placing or resetting glass in metal skylights. This cement is not affected by heat or cold, sun or any kind of weather, or salt water. It will not shrink but will make an absolutely tight joint between frame and glass, stone or concrete. Very valuable for marine work.



**Application of Smooth-On Putty Cement No. 6,
to uneven places, butt seams, etc.**



SMOOTH-ON Putty Cement No. 6 is used for filling up seams, rivet heads and other uneven places on iron and steel plates, where a hard smooth surface is desired.

There are many places about a steamship where SMOOTH-ON Cements may be used to advantage.

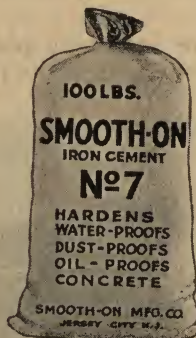


SMOOTH-ON IRON CEMENT No. 7



Sold in 5 and 10 Pound Cans like the above.

25, 50 and 100 Pound Packages like below.



For full description and directions regarding SMOOTH-ON Iron Cement No. 7 send for SMOOTH-ON Instruction Book No. 7. Only partial directions in this book.

SMOOTH-ON

Iron Cement No. 7.

FOR a complete story of Smooth-On Iron Cement No. 7 and complete specifications for its use, send for "Smooth-On Iron Concrete Instruction Book No. 7.

Smooth-On Iron Cement No. 7 is a hydraulic chemical, iron cement, prepared and sold in powder form, for waterproofing, dustproofing, and oilproofing concrete, and brick work, and making water tight joints on underground iron tubes.

It is used alone or in combination with Portland cement or with Portland cement and sand. The cement must be kept dry and the can closed, when not in use.

Smooth-On Iron Cement No. 7 added to Portland cement and sand, does not change their working qualities.

Concrete, with Smooth-On Iron Cement No. 7 added to it, is applied just the same as without it.

Smooth-On Iron Cement No. 7, when mixed with water, expands in hardening. This action, filling the pores of concrete, makes a bond, makes concrete containing Smooth-On Iron Cement No. 7 denser, harder, and waterproof.

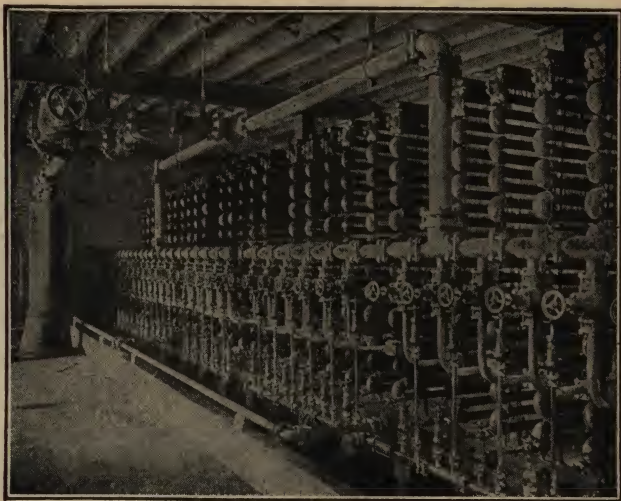
WATER TIGHT TUBE JOINTS.



This tunnel was lined with a cast iron sectional lining. A caulking groove $\frac{1}{2}$ -inch wide and 1-inch deep between the sections was filled with SMOOTH-ON No. 7 mixture to make the joints water-tight and prevent leakage into the tunnel, half of the tunnel being below high-water mark and also subject to much ground water. The SMOOTH-ON Cement Mixture was applied quickly and without any caulking as follows:

The dry SMOOTH-ON No. 7 mixture was mixed with water to the proper consistency and placed in pails. The men who filled the caulking grooves carried trowels and mortar boards, keeping the mortar board supplied from the pails and applying the cement to the caulking groove with the trowel. The SMOOTH-ON is thrown into the groove and smoothed off with the trowel, allowing the work to be done quickly and making the joint tight.

CONCRETE PIT FLOOR MADE TIGHT.



See the Cooling Water Flowing Over the Pipes.

FOREST PARK HYGIENIC ICE CO.

Jamaica and Mott Avenues,

UNION COURSE, N. Y., July 2nd, 1912.

SMOOTH-ON MFG. CO.,

572 Communipaw Avenue,

Jersey City, N. J.

Dear Sirs:—In the spring of 1910 we installed a 250 ton ice machine, and at the same time an ammonia condenser was placed over our engine room. As the water had to flow over the outside of the condenser pipes for cooling purposes it was necessary to have an absolutely waterproof floor under them. This floor was built of concrete. After being in use a short time, cracks and leaks developed so badly that pails had to be set in the engine room to catch the water, as it leaked through the concrete floor.

Your representative, Mr. C. E. Googins, called, and I showed him our trouble. He stated that SMOOTH-ON No. 7 Cement mixed with any first-class Portland cement would make a permanent repair. We immediately placed an order, and made the repairs as per instructions. I am pleased to state that all our troubles in that respect have been obviated and the concrete floor is absolutely waterproof.

Very truly,

H. HOLMGNEST,
Chief Engineer.

AHM—HH

Smooth-On Oil-proof Concrete Power House Floor



Floor and Engine Room, Thomas Oakes & Co.

Bloomfield, N. J., Sept. 24, 1915

Mess. Smooth-On Mfg. Co.,
570 Communipaw Ave.,
Jersey City, N. J.

Gentlemen:

Replying to your letter of the 23d inst. in regard to the Smooth-On concrete floor we have in our power house:

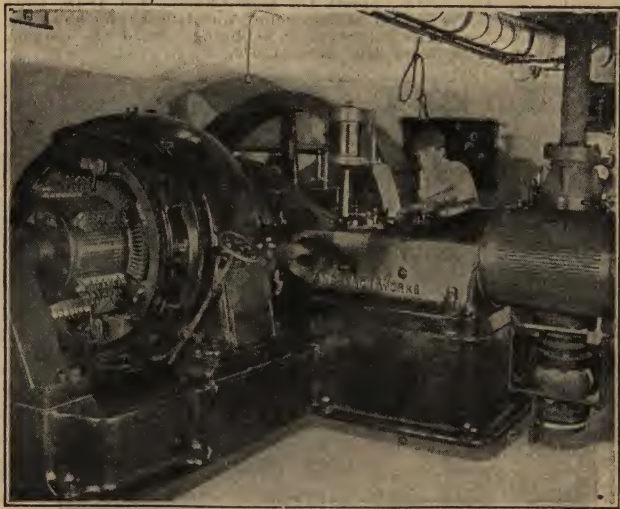
It gives us much pleasure to write you that the floor is most satisfactory; we have never favored cement floors, but in this No. 7 Smooth-On finish we find a floor that overcomes all our objections to the regular cement floor and can recommend it very highly for this purpose.

Very truly yours,

GAO.C

THOS. OAKES & CO.

SMOOTH-ON CONCRETE ENGINE BED



C SHOWS CONCRETE BASE

SMOOTH-ON MFG. CO.,
Jersey City, N. J.

Brooklyn, N. Y.,
Nov. 11, 1913.

Gentlemen:

About one year ago, your Engineer called and explained the value of Smooth-On Iron Cement No. 7, used in combination with concrete, for making a firm and solid foundation for an engine bed.

As we were about to install another engine and having used your other Smooth-On products with success, I gave instructions to have the required amount of Smooth-On No. 7 mixed with the concrete.

I am pleased to say it has been very satisfactory and I intend to use it in all of my future foundations.

Yours very truly,

S. J. TURNER,
Chief Engineer,
Vitagraph Co. of America.

BUTT SEAMS AND CONCRETE MADE TIGHT.

"Will Smooth-On keep walls and joints watertight?" The following work was done with Smooth-On Iron Cement ten years ago; it made all the joints in this caisson cellar watertight, and has kept them so ever since. The following is a photograph of the caisson cellar, and a letter from the contractors.



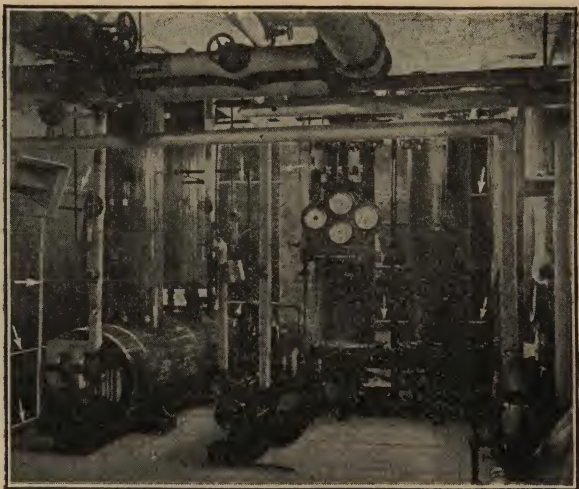
New York, January 15, 1902.

SMOOTH-ON MFG. CO.

Gentlemen: I beg to acknowledge the receipt of photograph showing some of our caissons in the cellar of the new Mutual Life Building, between Cedar and Liberty Streets, where we successfully used Smooth-On to get watertight joints against a head of thirty-five feet of water. In answer to your question, I would say that the architects for this work are Clinton & Russell, whose Engineer is Col. J. Hollis Wells, and the contractors are Arthur McMullen & Co., the writer being their Engineer.

Very truly,

T. KENNARD THOMSON.

BUTT SEAMS AND CONCRETE MADE TIGHT.

Engine Room Mutual Life Building.

NEW YORK, April 17, 1912.

SMOOTH-ON MFG. Co.,
572 Communipaw Avenue,
Jersey City, N. J.

Gentlemen:—We are pleased to state that the water-proofing done with your SMOOTH-ON Iron Cement in 1901 in the basement of the Mutual Life Building, between Cedar and Liberty Streets, New York, on the side walls and concrete floor has given satisfaction.

ARTHUR McMULLEN & Co.,
Singer Building, New York,
Contractors.

Smooth-On Concrete Floor



SMOOTH-ON CONCRETE BOILER ROOM FLOOR

COLGATE & COMPANY, JERSEY CITY

The trucking on this Smooth-On Concrete Floor consists of five ton coal trucks, drawn by horses. The coal is dumped as shown in the photograph.

The wheels of heavy coal trucks and horses' shoes will ruin an ordinary concrete floor in a very short time; the Smooth-On Concrete Floor presents a surface like flint which is not affected by the above heavy service.

The above floor also withstands the wearing action of the iron wheels of the coal wheelbarrows, which carry the coal from the main coal pile to the boilers, as shown in the photograph.

G. W. ADAMS, Pres.

TELEPHONE 1888 J. C.

J. R. RICHARDS, Treas.

HUDSON CONCRETE CONSTRUCTION CO. CEMENT AND CONCRETE CONSTRUCTION

452 MONTGOMERY STREET
JERSEY CITY, N. J.

ENGINE BEDS - ALL KINDS OF FLOORS
WALKS, WALLS AND STEPS

WATER TIGHT CELLARS AND PITS
SANITARY STABLE FLOORS

Mar. 10th, 14.

Smooth-On Mfg Co.

Jersey City N. J.

Gentlemen:-

In regard to use of your #7 Smooth-On Iron Cement, we wish to say, that results from our work on which we have used it have been very satisfactory.

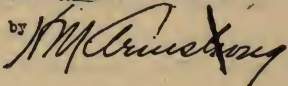
Having specialized on flat work in our line for past eleven years, we were somewhat prejudiced as to its use, but now find that properly handled, the finished work shows that "there's a reason"; and that the Contractor need have no fears as to its effecting the set or finish of his work.

We have recently completed the floor work in Colgate & Co's new power plant, using in the neighborhood of Four Thousand lbs. of #7 Smooth-On Iron Cement, the Engineers in charge have passed very favorably on same, and make special note of the improved texture of the surface.

Respectfully Yours,

HUDSON CONCRETE CONSTRUCTION CO.

by



A Unique Method of Repairing a Leaky Wrought-Iron Sewer Pipe.

Repair of a 36-in. Riveted Wrought-Iron Sewer Pipe
Through the Soffit of a Concrete Arch
Made with Smooth-On No. 7.

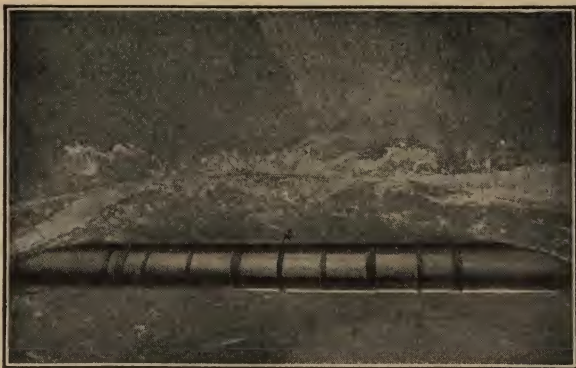


REPAIR BEING MADE.

By FREDERICK LATOURRETTE,
Engineer of Construction, Street and Water Department,
City Hall, Jersey City, N. J.

(From the Engineering News, December 21, 1911.)

Many times what seems to be a difficult problem to the engineer can be solved in a surprisingly simple manner, as the following case will illustrate. Our problem was the repair under difficult conditions of a 36-in. riveted pipe, of $\frac{3}{8}$ -in. wrought-iron, which had been in service for 35 years, to carry sewage under the floor of a bridge. Originally the pipe had been under the plank floor of a truss highway bridge, and had become deeply pitted by street



REPAIR COMPLETED.

droppings from overhead. Some time ago the bridge was replaced by a reinforced-concrete arch of 60-ft. span, into which a part of the pipe was built, the rest being exposed for a distance of about 50-ft. near the soffit of the arch. As a result of the pitting on the outside and the scour within, the pipe recently began to leak badly, and some means of repairing it cheaply and quickly became imperative.

The sewer above this point is on considerable grade, so that the pipe often runs full and occasionally under some pressure. The pitting extended around the entire circumference, and leaks developed along the whole length of the bottom and for about one-third the distance up the sides. As the pipe was suspended over a street, and the sewage could not be diverted to another pipe, the situation called for prompt attention.

Plans and specifications were arranged for making repairs by leaving the old pipe in place and building another of 4-ins. larger diameter around it, filling the 2-in. space between with Portland cement grout. This method would have necessitated cutting

away the arch ring around the pipe, inserting the covering pipe in semi-cylindrical sections, and replacing the arch ring with new concrete when the new pipe was in place. Only one bid was received for undertaking the work under this plan, and that bid (about \$3,600) was out of all proportion to the necessary cost of the repairs, and was, moreover, a larger sum than the city had appropriated for the work. The case was further complicated by a city ordinance which forbids contracts in excess of \$500 without requisite advertising; and advertising again would take time.

It was then that we hit upon the idea of using SMOOTH-ON Iron Cement. This cement had been previously used in some minor cases with complete success. The chief problem now was that this cement would not hold unless applied to a perfectly dry surface. Some way had to be devised for stopping the innumerable leaks.

This was accomplished by first removing all loose rust and scale. The leaks were then stopped by inserting dry wooden plugs, carefully whittled to fit the pits, some of which were nearly as large as the palm of the hand. One particularly bad place was fixed by covering it with a piece of burlap which had been previously prepared with coatings of shellac and red lead. This was smoothed over the leaky area and held until the lead had set. All leaks were finally closed and dry surface obtained. The entire surface of the pipe was then painted with a solution of SMOOTH-ON Cement No. 2, applied with a heavy paint brush. When this coat was dry a heavier covering of the same material was troweled on.

The concrete arch was cut away from the lower half of the pipe, so as to allow the semi-cylindrical plates which were used to cover the lower half of the pipe to enter 12 ins. into the soffit. These plates were 3/16-in. thick and about 10 ft. long, curved to a radius about 1 in. greater than the greatest of side radius of the pipe. The joints between the plates were made by butting the ends together and covering them with a 3/16 x 8-in. iron band, which

passed entirely around the pipe. Between the joints were two 3-16 x 4-in. bands, which also bound the semi-cylindrical outside shell to the old pipe. The inner surfaces of the bands were carefully coated with soft cement before the bands were put in place.

The space between the shell and the pipe was then poured full of a mixture composed as follows:

SMOOTH-ON Concrete Iron Cement No. 7..1 part by volume
Sharp sand1 part by volume
Dykerhoff Portland cement1 part by volume

This space varied from 7-16-in. over the outside plates of the pipe to $\frac{7}{8}$ -in. over the inside plates. The top of the pipe was then plastered over with a coating of the same mixture applied with a trowel. When completed the pipe was as good as new with a cost of about \$1,000. All work was done by city employees, and no single contract for material amounted to over \$500. The accompanying illustrations show the work in progress and the completed job.

Concrete Floor Made Hard

GLASGOW'S EXPRESS, 572 JACKSON AVENUE.

JERSEY CITY, N. J., April 17, 1912.

Five years ago I laid a SMOOTH-ON concrete floor in my stable and storage yard. The object being to make the floor water-proof and also to harden it. A layer of SMOOTH-ON was applied over the cinder concrete bottom, allowed to harden, and then cinder concrete applied over it as a top coating, some SMOOTH-ON Iron Cement being mixed in the top coating.

Horses and trucks pass over this floor continually and it has not shown wear or leak. I take pleasure in recommending the SMOOTH-ON Iron Cements for this work.

Very respectfully,

S. D. GLASGOW.

BRICK TANK



Built with Smooth-On Iron Cement No. 7 Mixture.

JOHN W. GRANT,

MASON AND BUILDER, 99 WEST 14TH STREET,
SMOOTH-ON MFG. CO.

BAYONNE, N. J., June 3, 1912.

Dear Sirs:— In reply to yours of an early date will say that I have used the SMOOTH-ON No. 7 on several jobs and find that in using same for a water tight job there is no superior, and I can highly recommend it. I have just finished a large brick tank for the Voorhees Rubber Mfg. Co. in Jersey City, using No. 7 SMOOTH-ON in the mixture, the exhaust from three large engines driving into it, and find the cistern to be absolutely without a leak. Am now using No. 7 SMOOTH-ON in the mixture of fireclay to lay fire brick in furnaces. So far I find it excellent.

Yours very respectfully,

JOHN W. GRANT.

INSIDE OF BRICK TANK



Coated with Smooth-On Iron Cement No. 7 Mixture

JERSEY CITY, N. J., July 3, 1912.

SMOOTH-ON MFG. CO.,
572 Communipaw Avenue,
Jersey City.

Gentlemen:—The brick and concrete tank built for us by Mr. Grant is perfectly tight. We are very well pleased with your SMOOTH-ON Iron Cement No. 7 for waterproofing concrete and brick work.

Very respectfully yours,

VOORHEES RUBBER MFG. CO.,

JOHN J. VOORHEES, JR., Treasurer.

CRACKS IN CONCRETE TANK REPAIRED



MEAD, JOHNSON & CO.

MANUFACTURING CHEMISTS,

Laboratory Corner Bergen and Kearney Avenues

JERSEY CITY, N. J., June 15, 1913.

THE SMOOTH-ON MFG. CO.

55 Harrison Avenue, City

Gentlemen:—We are pleased to report that the SMOOTH-ON preparation sent us by you for stopping the leaks in our concrete water cooling tanks or ponds has proven entirely successful where Portland cement and other substances were failures. Our ponds are now water tight.

Very truly yours,

MEAD, JOHNSON & CO.

Wooden Tank Water-proofed



The above wooden tank for boiling glue leaked and it was made tight by applying a half-inch lining of Smooth-On Iron Cement No. 7 mixture.

The work was done as follows:

The tank was thoroughly cleaned.

The floor and walls were coated with a Smooth-On bonding coat of

Smooth-On Iron Cement No. 7, 1 part by volume.

Portland Cement 1 part by volume.

Water $1\frac{1}{2}$ parts by volume.

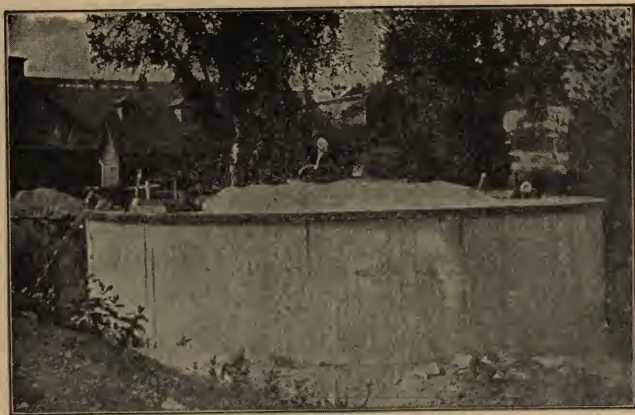
Before the bonding coat metallized, galvanized nails with large flat heads were driven into the walls three inches apart, leaving $\frac{1}{4}$ -inch of the nail above the surface.

The balance of the work was done as per Specifications D.

The floating coat mixture was applied to the floor as per Specifications A, for a smooth wearing surface. Care was taken to make a fillet at all corners of the tank.

The above tank was water-proofed September 13, 1913, for the Peter Cooper's Glue Factory, Brooklyn, N. Y.

Concrete Tank Oil-proofed



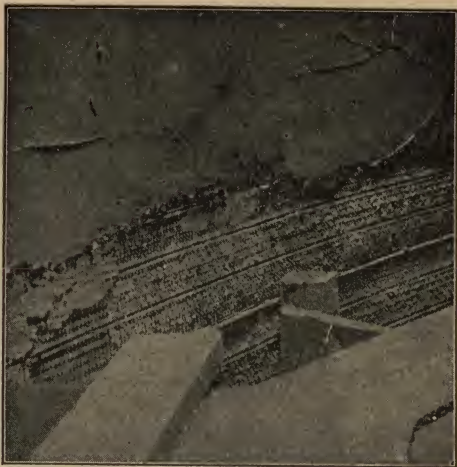
The photographs shown on pages 60 and 61 show the outside and inside of a 115,000 gallon concrete storage tank for holding fuel oil. This tank leaked when filled with oil after construction and was made oil-tight as per our Smooth-On mixture F, page 14, Book No. 7, for gasoline and oil-proofing concrete.

The Work Was Done as Follows:

The tank was lined with hyrib; this was necessary because it was impossible to clean away the tar and paint of previous oil-proofing compounds that had failed.

The space between the hyrib and the wall was filled in with a one to six mixture of Portland cement and sand, then a $\frac{1}{4}$ -inch coating of Smooth-On oil-proof mixture was applied in sections about 6 feet high and 150 feet long and brushed with a broom, to

Concrete Tank Oil-proofed



make a rough surface. When set hard enough to hold it, a second coat of Smooth-On oil-proofing $\frac{1}{4}$ -inch thick was applied and allowed to set two or three hours, then a wash of

Smooth-On Iron Cement No. 7—one volume
Portland Cement—one volume
Water— $1\frac{1}{2}$ volumes

was brushed on and troweled in well, care being taken to first use a wooden float to get an even surface, then finishing with a steel smoothing trowel, until a perfectly smooth glazed finish, free from all pin holes, was obtained.

The floor coating was $\frac{3}{4}$ -inch thick, applied directly to the old concrete flooring. A centrifugal fan supplied air for ventilation, which hastened the hardening of the Smooth-On. All joints were Smooth-On bonded when work was stopped for the day.

The above tank has been in use 6 months and is perfectly tight.

Underground Concrete Tanks for Storing Gas Oil



B

- a.* Interior view showing a corner section of walls and bottom oil-proofed.
b. Finished tanks showing top-pumping pipes and connections.

Net inside dimensions 32' x 12' x 9'.

Oil-proofed by Smooth-On Iron Cement No. 7 method, August, 1913. The following letter shows the results:

Austin, Minn., Dec. 29, 1913

Smooth-On Mfg. Company,
Jersey City, N. J.

Gentlemen:

We have your letter of the 26th inst. and note your inquiry in regard to the success we have had with your No. 7 Smooth-On used for oil-proofing our oil storage tank.

Have to say that we have both tanks in use and have kept a careful measure of the oil in each for a considerable time before using any oil from the tank. Am pleased to report that it does not show the least sign of leakage. We are very much pleased with the results.

Yours very truly,

AUSTIN GAS COMPANY,

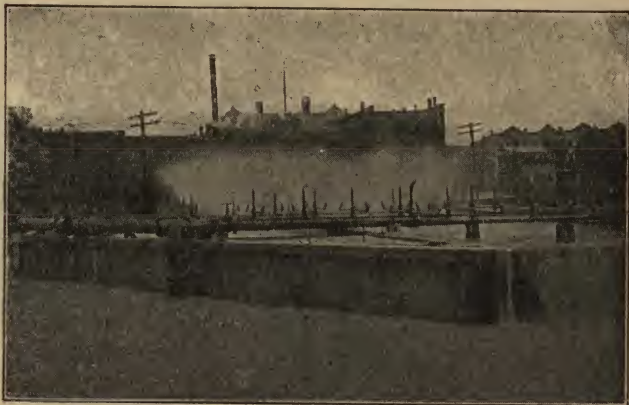
Z. T. F. RUNNER, Pres't

ZTFR-H.

Concrete Cooling Tank

repaired with

Smooth-On Iron Cement No. 7



Three bad leaks in the expansion joints of the concrete cooling tank shown in this picture were made tight with Smooth-On Iron Cement No. 7 mixture, using Specifications G for repairing cracks in concrete, book No. 7.

The repair was made in one day without removing the water from the tank. The warm water in the tank and the free circulation of air hastened the hardening of the Smooth-On Mixture to such an extent that the Smooth-On held against the water pressure, metallizing rapidly.

This tank is situated at the Whitlock Cordage Co., Jersey City, N. J.

SMOOTH-ON CONCRETE FLOOR LAID OVER A WOOD FLOOR



GEORGE M. HAYNER CO.
Manufacturers of
WOOD FIBRE TWINES AND SEAMING CORDS
Nos. 539-541 West 56th Street

New York, Nov. 21, 1918.

SMOOTH-ON MFG. Co.,
572 Communipaw Ave.,
Jersey City, N. J.

Gentlemen:

We wish to advise you that in September 1917, we covered a wooden floor 48x125 feet on the third story of our building with SMOOTH-ON concrete mixture as per your instruction book No. 7.

This wooden floor was out of level, so it was necessary to vary the thickness of the SMOOTH-ON concrete from 2 to 4 inches, in order to make the finished floor level.

This room is used for manufacturing purposes and the floor is given heavy service. We are pleased to say that the SMOOTH-ON concrete flooring is giving perfect satisfaction. It is easy to keep clean for we can now wash the floor down with water, as it is absolutely water tight. We also find that this SMOOTH-ON Concrete floor has stiffened the building.

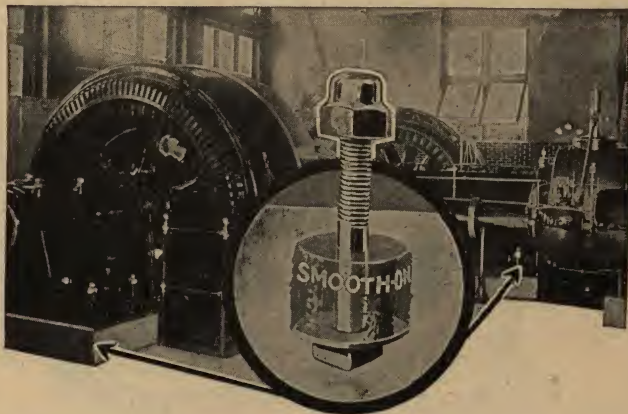
Trusting that the above will interest you, we remain,

Very respectfully yours,

GEORGE M. HAYNER COMPANY,

Chas W. Wood, Ch. Eng.

AN ENGINE FOUNDATION THAT STAYS RIGHT



Ordinary concrete engine foundations, as you know, are not satisfactory. Machine oil penetrates into the concrete and it quickly disintegrated under vibration.

But concrete can be made oil-proof, and waterproof, wear-proof and more durable as well by mixing SMOOTH-ON Iron Cement No. 7 with portland cement and sand. Read this letter.

J. GEO. GRAUER'S
RIDGEWOOD PARK BREWERY
Brooklyn, N. Y., August, 1917.

SMOOTH-ON MFG. CO.,

Gentlemen:—For over three years, the foundation of our 300-ton ice machine was loose. Through the use of SMOOTH-ON No. 7 mixed with portland cement and rough sand, we have been enabled to overcome this and now have a very strong foundation which causes us no trouble.

Respectfully,
PETER MULLER, *Chief Engineer.*

SMOOTH-ON IRON CONCRETE PAINT



Sold in $\frac{1}{2}$ and 1 gallon tins

SMOOTH-ON IRON CONCRETE PAINT

is very valuable

for surfacing hard, dry concrete floors, roofs or walls, to prevent dusting, to make them water-proof and to increase their wearing quality.

Quantity Required:—Each gallon weighs 21 pounds and under average conditions will cover 200 square feet with one coat.

SMOOTH-ON IRON CONCRETE PAINT

Smooth-On Iron Concrete Paint is a fluid preparation of Smooth-On Iron Cement, made only in one color, dark gray, the color of Smooth-On Iron Cement.

When Smooth-On Iron Concrete Paint is applied to concrete surfaces it penetrates the surface and then sets or metallizes. This action bonds the Smooth-On to the concrete and makes a hard wearing surface of iron.

One application of Smooth-On Iron Concrete Paint under ordinary conditions will stop the dusting of concrete floors and make them waterproof. For severe cases where two applications are necessary allow three days between first and second applications. The floors may be used 24 hours after the application of Smooth-On Iron Concrete Paint.

If the concrete floor or wall contains holes, uneven places or granulated concrete, these places must be repaired with Smooth-On Iron Cement No. 7, before the application of Smooth-On Iron Concrete Paint.

Directions.—The floor must be clean and dry; all dirt, dust, and loose concrete positively removed before the application of Smooth-On Iron Concrete Paint. Smooth-On Iron Concrete Paint should be applied with a stiff brush and well worked into the concrete.

Smooth-On Iron Concrete Paint is very valuable for painting the concrete of vault lights. It makes the concrete waterproof and fills all openings between concrete and glass. It is also successfully used for painting expansion joint seams on roofs.

If the Smooth-On Iron Wearing Surface is applied by using Smooth-On Iron Cement No. 7 when the floor is laid, this paint is not necessary.

SMOOTH-ON

Coated Corrugated Gaskets



Be Sure It's the SMOOTH-ON Label Before You Buy.

The best gaskets for flanged joints for any pressure or temperature, for Steam, Water, Oil, Air or Ammonia.

List Price, 1 cent per square inch surface measurement
F. O. B. Jersey City, U. S. A.

OBERMEYER & LIEBMANN

Forrest, Noll & Bremen Sts.,

Brooklyn, N. Y.

May 6, 1918.

SMOOTH-ON MFG. Co.,
570 Communipaw Avenue,
Jersey City, N. J.

Gentlemen:

I am presenting you with one of your gaskets, which has been in the main steam line connected to our 300 ton refrigerating machine, for the term of six and one-half years, and never gave us a suspicion of a leak during that period.

It was taken out on account of some changes we made in this line, and as in previous cases had intended to again use it, but your Mr. Googins having expressed the desire for us to furnish him with a gasket which had done service, I left it out for him to use for any purpose he may see fit.

This gasket was put in coated on both sides with your No. 3 Cement, and after being drawn up on the bolts, steam was turned on as is usual, at about 10 lbs. pressure, and then followed up afterwards with a higher pressure. Our boiler pressure is 135 lbs. and I may add the pressure on this gasket has never been off for the term above specified.

Yours very respectfully,

OBERMEYER & LIEBMANN

Per. Richard Strohm,

Chief Eng.

SMOOTH-ON GASKETS are made from sheets of specially prepared iron, which are rolled with concentric corrugations, and then coated with one application of SMOOTH-ON Elastic Iron Cement. The gasket is then ready for immediate use. When heavy or thick gaskets are desired two or more gaskets may be used, or an extra coating of SMOOTH-ON Elastic Cement applied; when steam is turned on after the gaskets are bolted in the flanges, tap the bolts lightly with a hammer to settle the nuts and the metal in the joints, and then try the nuts with a wrench. These gaskets may be used in place of rubber, asbestos or copper gaskets.

1. A SMOOTH-ON Gasket expands and contracts the same as iron with alternate high and low temperatures.

2. Joints can be easily taken apart by loosening bolts and inserting a thin knife between the gasket and faces on each side, and the gaskets used again by coating with SMOOTH-ON Elastic Cement.

3. When the surfaces of the flanges are uneven or pitted, fill the uneven places with SMOOTH-ON Iron Cement No. 1.

We make a narrow and full width gasket for each size flange. The narrow gasket covers the surface of the flanged faces inside the bolt line circle; the full width covers the full surface of the flanged face. We advise the narrow width SMOOTH-ON Gasket, as from three to four corrugations are all that are necessary to make a joint.

Use Narrow Width Gaskets.



NARROW WIDTH GASKET.

We advise narrow width or inside bolt hole SMOOTH-ON Corrugated Iron Gaskets, coated with an extra coating of SMOOTH-ON Elastic Cement No. 3 immediately before application. This information has been gathered from many engineers, who have used both full width and narrow width SMOOTH-ON Gaskets.

Coating the gasket with SMOOTH-ON Elastic Cement immediately before application, forms a fillet of SMOOTH-ON Iron Cement, around the inside of the joint, which guarantees a tight joint **every** time.

Also a narrow width gasket costs less than a full width gasket.

Notice—It will improve any gasket to coat it with SMOOTH-ON Elastic Cement No. 3, immediately before application.

STANDARD SIZES

Of Smooth-On Coated Corrugated Gaskets
for Pressures up to 200 lbs.

Always on Hand.

Full Width Gaskets.

Narrow Width Gaskets.

Pipe Size. Inches.	Full Width. Inches.	List Price.	Narrow Gaskets Inside Bolt Holes Inches.	List Price.
2	2 x 6	\$0.25	2 x 4	\$.095
2½	2½ x 7	.335	2½ x 4¾	.125
3	3 x 7½	.37	3 x 5¼	.145
3½	3½ x 8½	.475	3½ x 6¼	.210
4	4 x 9	.515	4 x 6⅝	.215
4½	4½ x 9¼	.52	4½ x 6⅞	.210
5	5 x 10	.585	5 x 7⅝	.261
6	6 x 11	.67	6 x 8⅝	.319
7	7 x 12½	.845	7 x 9⅞	.380
8	8 x 13½	.92	8 x 10⅞	.418
9	9 x 15	1.13	9 x 12⅜	.560
10	10 x 16	1.23	10 x 13¼	.60
12	12 x 19	1.71	12 x 16	.88
14	14 x 21	1.93	14 x 17⅝	.90
15	15 x 22¼	2.12	15 x 18⅞	1.03
16	16 x 23½	2.31	16 x 20⅞	1.17
18	18 x 25	2.36	18 x 21½	1.08
20	20 x 27½	2.80	20 x 23¾	1.29
22	22 x 29½	3.04	22 x 25⅞	1.46
24	24 x 32	3.51	24 x 28½	1.69
26	26 x 34¼	3.91	26 x 30⅝	1.94

STANDARD SIZES

Of Smooth-On Coated Corrugated Gaskets
for Working Steam Pressure 250 lbs.

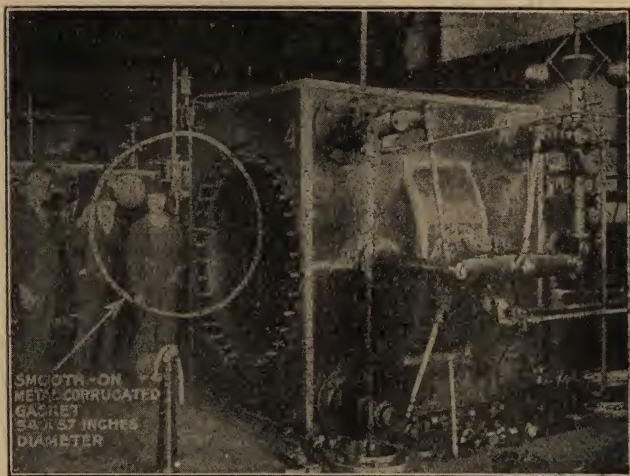
Always on Hand.

Full Width Gaskets.

Narrow Width Gaskets.

Pipe Size. Inches.	Full Width. Inches.	List Price.	Narrow Gaskets Inside Bolt Holes Inches.	List Price.
2½	2½ x 7½	\$0.39	2½ x 5	\$0.145
3	3 x 8½	0.50	3 x 5¾	0.20
3½	3½ x 9	0.545	3½ x 6½	0.235
4	4 x 10	0.655	4 x 7	0.26
4½	4½ x 10½	0.71	4½ x 7¾	0.30
5	5 x 11	0.755	5 x 8¾	0.365
6	6 x 12½	0.95	6 x 9¾	0.47
7	7 x 14	1.155	7 x 10¾	0.545
8	8 x 15	1.26	8 x 12	0.62
9	9 x 16	1.37	9 x 13	0.69
10	10 x 17½	1.64	10 x 14¼	0.82
12	12 x 20	2.01	12 x 16¾	1.08
14	14 x 22½	2.44	14 x 19	1.30
15	15 x 23½	2.55	15 x 19¾	1.33
16	16 x 25	2.90	16 x 21¾	1.59
18	18 x 27	3.18	18 x 23¾	1.73
20	20 x 29½	3.70	20 x 25½	1.97
22	22 x 31½	4.00	22 x 27½	2.14
24	24 x 34	4.55	24 x 30	2.54

CYLINDER HEAD GASKET.



The above picture shows a gasket 54 inches by 57 inches (made in one piece) being placed in position at one of the largest power houses in New Jersey. The engineer wrote as follows:

NEWARK, N. J., Sept. 27, 1909.

Gentlemen:—Before using SMOOTH-ON Gaskets, I had a lot of trouble with cylinder head joints; some of my SMOOTH-ON Gaskets have been in position over a year, carrying 160 pounds of pressure, and they are all giving perfect satisfaction.

Very respectfully yours,

G. L. TRYAN, *Chief Engineer.*

168 GASKETS—ALL TIGHT.



ROCKWOOD & COMPANY
Brooklyn, N. Y.

Nov. 2d, 1911.

THE SMOOTH-ON MANUFACTURING COMPANY,
Jersey City, N. J.

Gentlemen.

We have used in our 1400 H.P. Boiler Room, since June 17, 1909, 168 SMOOTH-ON Coated Corrugated Metal Gaskets and up to the present time, we have not had a leak.

I, as engineer of this plant, consider this remarkable, as the piping is very intricate. SMOOTH-ON Gaskets are certainly great insurance against leaking flanged joints.

Wishing you success, I remain,

Very truly yours,

Andrew Meyer, Engineer in Charge,
ROCKWOOD & COMPANY.

MS.

STEAM CYLINDER GASKET AND SMOOTH BOILER PATCH.



The place where the SMOOTH-ON patch was put on is indicated by "B," while the joints in which SMOOTH-ON gaskets were used are indicated by the letters "A."

A description of the work is given on the next page.

Steam Cylinder Repaired

FOR POWER PLANT

March 8, 1909.

SMOOTH-ON MFG. Co., Jersey City, N. J.

Gentlemen:—In regard to our experience with your SMOOTH-ON Corrugated Gaskets, beg to say that we had a particularly hard cylinder head joint to hold, and after trying a number of different packings for this joint, among which was corrugated copper, all of which failed to hold for any great length of time, we decided to try one of your corrugated SMOOTH-ON Gaskets on this joint, which we did, and it has now been in use about one year, carrying 160 lbs. pressure, and has given us no further trouble.

In regard to a patch put on by your Mr. Googins for us on a crack in the steam chest of the h. p. cylinder of a 26x54x36 ft. vertical engine, would say it has now been in use about ten days, and is still tight under 160 pounds pressure. The back of this patch was covered with No. 1 SMOOTH-ON and drawn into place by heavy straps and allowed to set, and now has the appearance of having made permanent job, thus saving the cost of a new steam chest.

Yours respectfully,

G. A. MERRILL,

Chief Engineer.

DE LAMAR'S COPPER REFINING CO.

H. A. PROSSER, General Manager.

CHROME, N. J., May 16, 1906.

SMOOTH-ON MFG. CO.,

572 Communipaw Ave., Jersey City, N. J.

GASKETS.

Gentlemen:—Replying to your inquiry of yesterday, we have not yet put our superheater in service. We expect to do so in about two weeks. Our saturated header is now in service, and every gasket was tight when the steam was turned on. We have your SMOOTH-ON Gaskets on both headers. The superheater header will be a particularly difficult test, as, at times, saturated steam is substituted for the superheated, and up to this time we have had nothing in the way of a gasket which has been entirely satisfactory for both services, although we have no difficulty in maintaining lines which are kept entirely on either one service or the other.

We shall be pleased to let you know of our success with your gaskets on this service in a few weeks.

Yours truly,

(Signed)

LAWRENCE ADDICKS,

Superintendent.

ADX—E. J. B.

READ NEXT PAGE.

DE LAMAR'S COPPER REFINING CO.**H. A. PROSSER, General Manager.****LAWRENCE ADDICKS, Superintendent.****CHROME, N. J., Sept. 12th, 1906.****SMOOTH-ON MFG. Co.,****Jersey City, N. J.****GASKETS.**

Gentlemen:—Replying to your inquiry of Sept. 11th, the **SMOOTH-ON Coated Corrugated Gaskets** which we installed throughout our high pressure piping have been entirely satisfactory, and have been the only gaskets which we have found so far which will stand both superheated and saturated steam applied alternately. We have had our superheater out of service several times since the pipes have been put in commission and no leaks have developed.

(Signed) |

LAWRENCE ADDICKS,**Superintendent.****ADX—E. J. B.****April. 14th, 1911.****THIRD TESTIMONIAL FROM****DE LAMAR'S COPPER REFINING CO.**

Gentlemen:—Replying to your inquiry as to whether the **Corrugated Iron Gaskets** which we installed in 1906 in this plant, have continued to give satisfaction, we are pleased to state that our steam lines have remained tight and that the gaskets have given no trouble whatever.

Yours truly,**LAWRENCE ADDICKS,****Superintendent.**

STEAM CYLINDER GASKET.

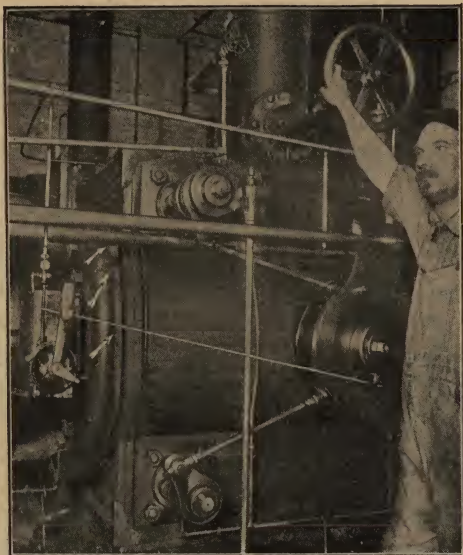


Fig. 1. SMOOTH-ON Repair on High Pressure Cylinder.

SMOOTH-ON MFG. Co.,
572 Communipaw Avenue,
Jersey City, N. J.

Sept. 15, 1915.

Gentlemen:

I have in my care, with other machinery, a 27x36x50 Cross compound refrigerating machine, and until SMOOTH-ON helped me out always found it a very difficult job to hold the joint tight. (See Figure 1 marked with arrows, where the girder bolts on to the high pressure cylinder.) I tried copper gaskets and also sheet packing gaskets and they only held the joint for a short period. In April, 1914, I tried SMOOTH-ON Coated Corrugated Iron Gasket, which before applying I coated with SMOOTH-ON Elastic Cement No. 3, put it in position and bolted the machine together, and after 24 hours started to operate; the joint has been tight ever since.

When I was compelled through a faulty foundation under the **low pressure cylinder** to remove it from the girder, I

STEAM CYLINDER JOINT MADE TIGHT.

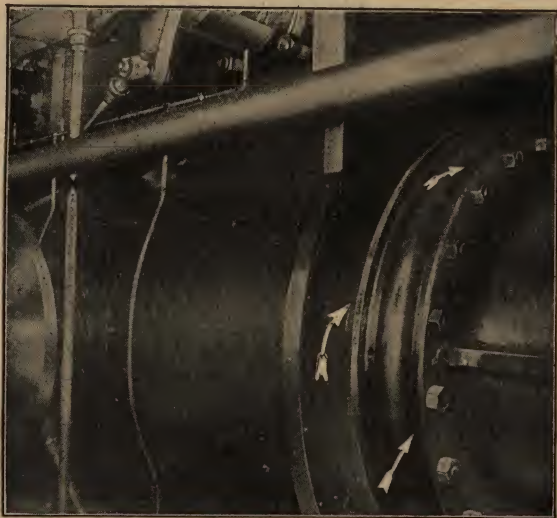


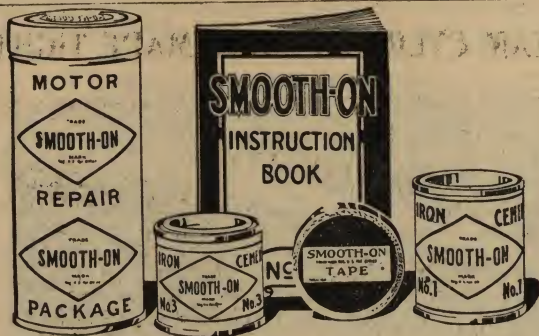
Fig. 2. SMOOTH-ON Repair on Low Pressure Cylinder.

found after having the foundation rebuilt that the face of the low pressure cylinder would not come parallel with the face of the girder. (See Figure 2 marked with arrows.) Governed by the great success of the last job I decided to try SMOOTH-ON on this job. I mixed three parts of SMOOTH-ON Elastic Cement No. 3 with one part of SMOOTH-ON Iron Cement No. 1 to the consistency of a thick putty and applied it to the face of the joint with a trowel about $\frac{1}{16}$ inch thick and bolted the cylinder on to the girder, being very careful not to bring the same out of alignment. Before starting the machine I warmed this joint up very gradually. The joint is now absolutely tight. This job was done in March, 1915.

I am certainly more than pleased with the SMOOTH-ON Iron Cements and Gaskets and the results that can be obtained from them and I can recommend your products very highly.

Yours very respectfully,

Henry Burkhardt, Chief Engineer.



SMOOTH-ON MOTOR REPAIR PACKAGE

FOR ROADSIDE AND GARAGE REPAIRS

A SMOOTH-ON Repair Package in the automobile, garage, shop, home, or on the farm, is insurance against long and expensive delays by unforeseen accidents, as with it, repairs are easily and quickly made.

SMOOTH-ON is a chemically prepared Iron Cement sold in powder and paste form. It expands and contracts with the iron to which it is applied, and is not affected by heat, cold, water, gasoline or oil.

The SMOOTH-ON Motor Repair Package is a compact package of SMOOTH-ON repairing cements, which enables you to make permanent repairs on water-jackets, engines, boilers, tanks, screw-thread joints, pumps, pipes, etc.

The package contains one 1-pound can SMOOTH-ON Iron Cement No. 1, one 1-pound can SMOOTH-ON Elastic Cement No. 3, one roll SMOOTH-ON Tape, one SMOOTH-ON Instruction Book.

Information pertaining to all classes of repairs made with our cements will be gladly furnished at all times. See pages 36 to 40.

HILL PUBLISHING COMPANY

Hill Building

New York

Office of John A. Hill, President

December 13, 1910.

SMOOTH-ON MFG. Co.,
572 Communipaw Avenue,
Jersey City, N. J.

Gentlemen:

Last summer I broke the direct clutch in the gear box of a six-cylinder automobile, and the hardened steel tooth was forced under the back-up gear and through the bottom of the aluminum gear case.

The mechanic who took it apart said that I must order a new case.

There was a round hole in the case and a lot of cracks leading into it, with a space of about $2\frac{1}{2}$ inches in diameter forced down around the hole and ready to drop out. It looked like a pie that someone had stepped in. I happened to think that I had one of your Motor Repair Packages on the car, and I experimented.

I laid a thin piece of brass over the break, punched a hole in it and dropped a two-inch carriage bolt through the opening, with a washer and nut on the bottom to hold the pieces of pie just where they were.

Then I took the bolt out, mixed up my SMOOTH-ON No. 1, filled the cavity, pushed the bolt through it and ran the nut up with my fingers on the outside and sealed the whole thing up with a little more cement.

The next day the patch was as hard as Pharaoh's heart and as tight as a drum, and the car is running to-day as good as ever.

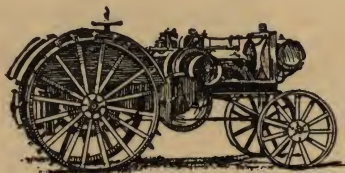
That little dollar outfit saved me \$75 in cash and gave me my car in a day instead of a month.

It's great stuff.

Yours very thankfully,

JOHN A. HILL.

TRACTOR REPAIR



SMOOTH-ON MFG. Co., Jersey City, N. J.

Gentlemen:

A large tractor had been left out late in the fall with the result that both cylinder and water-jacket were cracked with the frost. The crack was about $\frac{1}{8}$ " wide and 14" long. I decided it was a good place to use SMOOTH-ON, so I fixed up both cylinders and the engine ran all the next summer without showing signs of a leak. When we took the engine down for repairs last spring we found that one cylinder was badly scored on one side, the full length of the cylinder; so decided to try oxyacetyline welding and to save gas we heated the cylinder to a dull red. I said good-bye to SMOOTH-ON. Well we filled the score and after the cylinder cooled, we rigged up a flexible shaft and small emery wheel and ground out the cylinder to a true circle; again tested for small leaks and to my surprise the SMOOTH-ON held, with the result that the engine was reassembled and operated all last summer again, without a leak, and we expect to run it as usual this year again. I consider this a very severe test for SMOOTH-ON and do not know whether you ever heard of a test like this one before, so decided to mention it to you, as I was asking for catalog anyway.

Yours truly,

WM. E. McCLELLAND, Engineer,
University of Saskatchewan, Saskatoon, Sask.

MOTOR REPAIR

168 Duane St., New York City.

August 5, 1920.

SMOOTH-ON MFG. CO.

574 Communipaw Ave.,

Jersey City, N. J.

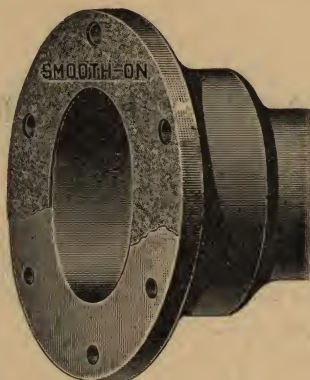
Gentlemen:

This is to advise you that I have had very satisfactory, practical, experiences with the use of your SMOOTH-ON. This was about three years ago when I used it on a crack in the water jacket on my motor car, after the garage mechanics wanted to take it out and have it welded, at prices for doing the work of from \$50 to \$150, notwithstanding the fact that the crack was only about three inches long and not very bad. I bought a small package of SMOOTH-ON, followed directions and have had no trouble since. It stopped the leak and the water has boiled over several times since then without affecting the mend.

Very truly yours,

J. E. MACE.

FLANGED JOINTS.



FLANGED JOINTS may be made with **SMOOTH-ON Elastic Cement** and **SMOOTH-ON Iron Cement No. 1**, in place of gaskets or sheet packing,

1. Take the desired quantity of **SMOOTH-ON Elastic Cement** and stiffen it to a very stiff putty, by adding to it **SMOOTH-ON Iron Cement No. 1**, as per directions, page 48. This is valuable for rough surfaces.

Apply this Compound to the flanged faces with a putty knife.

For temporary joints, first cover the flanged faces with graphite.

Apply the **SMOOTH-ON** to the flanged faces evenly and not too thick.

2. **SMOOTH-ON Elastic Cement** may be applied to paper for making flanged joints.
3. **SMOOTH-ON Elastic Cement** made stiff with **SMOOTH-ON Iron Cement No. 1** may be applied to wire gauze for making flanged joints.
4. **SMOOTH-ON Elastic Cement** is used for coating hemp or similar material, for making flanged pipe and cylinder head joints.

TABLE
showing the average weights of the Smooth-On
Iron cements.

	One cubic foot dry	one cubic foot mixed after it hardens
Smooth-On No. 1	193 lbs.	256
Smooth-On No. 2	193 lbs.	256
Smooth-On No. 3	made in Paste form 250	
Smooth-On No. 4	184 lbs.	245
Smooth-On No. 5	170 lbs.	220
Smooth-On No. 6	made in Putty form 235	
Smooth-On No. 7	211	260
Smooth-On No. 8	100	133

TABLE
Showing the average quantity of Smooth-On
No. 7 required for different Portland cement and
Sand mixtures when applied ONE INCH THICK.

Mixture by volume Sand Portland cement	Number of lbs. of No. 7 to 100 lbs. of Portland cement	Number of lbs. of No. 7 to every 100 square feet
2 to 1	15 lbs.	45 lbs.
2 to 1	20 lbs.	60 lbs.
2 to 1	25 lbs.	75 lbs.
1 to 1	15 lbs.	64 lbs.
1 to 1	20 lbs.	86 lbs.
1 to 1	25 lbs.	108 lbs.

TELEGRAPH AND CABLE CODE.

Telegraph Address :

Smooth-On Mfg. Co., Jersey City.

Cable Address :

Smoothon, Jersey City.

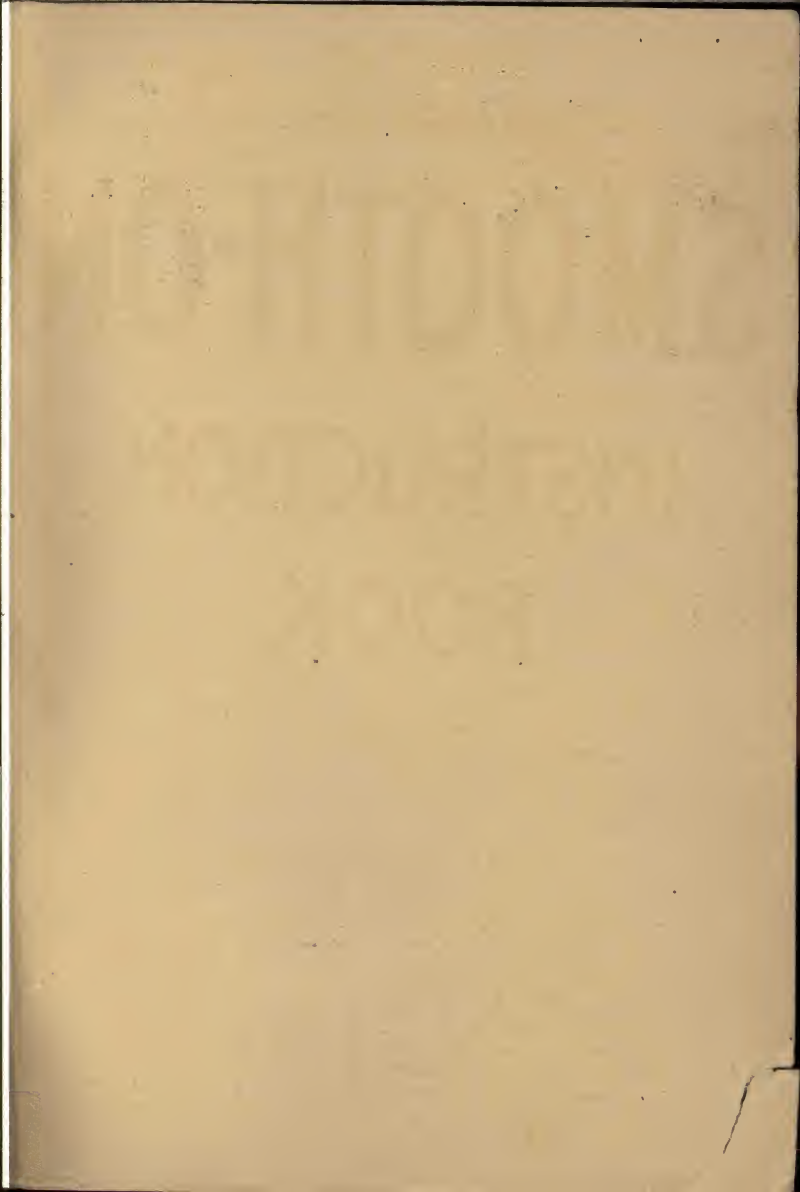
The following Code will be found convenient in ordering SMOOTH-ON Cements. We also have the A. B. C. Code, fourth edition and fifth edition.

GENERAL

Smooth-On Iron Cement No. 1.....	Admit.
Smooth-On Iron Cement No. 2.....	Blue.
Smooth-On Elastic Cement No. 3.....	Elastic.
Smooth-On Castings, No. 4.....	Admiral.
Smooth-On Joints No. 5.....	Red.
Smooth-On Rivet Cement No. 6.....	Rivet.
Smooth-On Iron Cement No. 7.....	White.
Smooth-On Iron Cement No. 8.....	Fire.
Smooth-On No. 9.....	Water.
Smooth-On Corrugated Gasket.....	Circle.
Smooth-On Iron Concrete Paint.....	Hard
Smooth-On Tape.....	Tape.
Smooth-On Repair Package.....	Gas.
Packed in one pound cans.....	Baby.
Packed in five pound cans.....	Boy.
Packed in ten pound cans.....	Bid.
Packed in twenty-five pound cans.....	Big.
Boxed and delivered F. O. B., N. Y.....	Betide.
Answer by wire.....	Bayonet.
As soon as possible.....	Bellows.
Have written you to-day.....	Bird.

SHIPMENTS AND ORDERS

Ship by freight, Steamer.....	Hammer.
Ship by express.....	Habit.
Ship by freight, R. R.....	Hackney.
Send shipping directions.....	Haggard.
Have you shipped our order of.....	Hallow.
Your order was shipped.....	Halter.
Duplicate our Order No.....	Hateful.
How soon can you ship.....	Hope.
Shipped as per your instructions.....	Harbor.
By what route was shipment made.....	Handcuff.
Telegraph at once when you can ship.....	Happy.
Send tracer for last order.....	Scud.



SMOOTH-ON

INSTRUCTION

BOOK

№18